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THE DENTAL DIGEST

VOLUME XXXV SEPTEMBER, 1929 NUMBER 9

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THE DENTAL DIGEST
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THE DENTAL DIGEST

VOLUME XXXV SEPTEMBER, 1929 NUMBER 9

Post-Operative Complications of Exodontia*

By M. HILLEL FELDMAN, D.D.S., New York, N. Y.

Chief, Dental Department, Lincoln Hospital; Instructor in General Anesthesia, Allied Dental Council; Author of *Textbook of Exodontia*

Dental literature abounds with the presentation of unpleasant concomitants of the extraction of teeth. A mere perusal of the descriptive matter by even a layman should be quite convincing that the problem confronting the dental operator is necessarily fraught with danger. Little wonder, then, that to the dental practitioner busy at his many daily tasks the disconcerting sequelae of extracting teeth are a source of frequent bewilderment and dismay.

One finds much contradictory evidence in the literature on the causes for certain complications of exodontia and no less a collection of testimony tending to give apparently antagonistic views regarding the treatments of the conditions described. Where is one to pin one's faith? When the experts disagree, whom can we believe? Truly, the annoying problem of exodontia complications seems just as far as ever from solution, in so far as a definite and positive means for cure is concerned—a standardized technic for control of those sequelae which tax the nervous system not only of the patient but of the operator as well. Operative procedures are standardized, methods of treatment are standardized, yet in some cases one sees extremely unpleasant post-operative complications where by all the rules one should have been justified in expecting nothing especially unpleasant.

At the outset of this address may I quote from a treatise by George Blumer in the *Boston Medical and Surgical Journal,* February 11, 1926: "A tooth cannot under any circumstances be extracted without considerable trauma." I would ask you to try to keep this statement clearly before your mental vision so that you may understand at once why one encounters post-operative complications. Because one's technic is too frequently questioned when these unpleasant incidents crowd upon our operative procedures, one reads too often that such and such an operative complication is avoidable for one to feel complacent toward the libel. These statements give frequent basis for malpractice litigation and, for this reason if for no other, are deplorable.

I am going to take up the problems associated with the extraction of a tooth by seating our imaginary patient in the chair and placing the imaginary operator before the patient. Let us try to follow every step and move of our op-

* Read before the Passaic Dental Club, Passaic, N. J., May 21, 1929.

erator. Perhaps in this way I may be able to present in a less confusing manner some of the generally known and much feared post-operative complications.

Our patient requires the removal of a mandibular third molar. The tooth is rather carious, but firmly held by its investing tissues. Our operator proceeds to induce local anesthesia by blocking the mandibular nerve at its entrance to the foramen on the inner surface of the ramus. Now, several things might happen during the procedure of inducing this anesthesia.

(1) The needle might fracture.

(2) The muscle (internal pterygoid) might be pierced by the penetrating needle, causing a trismus of the jaw, when the resultant hemorrhage and discharge of the anesthetic solution within the muscle tissue follow.

(3) The periosteum, lining the inner surface of the ramus, might be scraped or only scratched.

(4) The tissues might be traumatized by a dull-pointed needle.

Now, if the needle has fractured and disappeared into the tissues, the manifest duty which presents itself is that of removing it, and unless our imaginary operator has seen such an operation or has performed one, he would do wisely to refer the patient at once to a surgeon. In the interim the treatment he can prescribe to allay the local inflammatory symptoms is that of ice-packs to the face, hot saline throat washes, and pyramidon in five-grain doses or codein in one-eighth-grain doses, both made up in tablet form and taken by mouth, once every two hours until pain subsides. This same treatment is applicable also for the discomfort arising from piercing the internal pterygoid muscle, or scraping the periosteum on the inner aspect of the ramus, or the traumatization of the soft parts by a dull needle. In other words, regardless of the degree of discomfort, the basic treatment is as described.

But our patient may develop, in spite of all efforts to prevent it, a deep-seated infection extending downward into the glands of the neck. He may experience difficulty in swallowing and breathing. He may run a temperature and present the well-known distressing symptoms of sepsis. What is the treatment here? If within a reasonable period of time following the onset of the initial symptoms of trismus and pain our operator finds that he is making no headway with the cold packs and hot saline throat irrigations, and that the swelling is increasing externally and internally, he changes from cold to heat externally; he prescribes hot boric acid fomentations on the face.

Do not be afraid to apply heat to the face externally. There seems to be a hesitancy in some quarters to do this, lest an abscess point externally and leave a scar. Such a fear is not founded on good surgical general practice. In medicine heat is applied to an area of suppurating deep-seated abscess in order to bring the infection to a more superficial area and facilitate drainage and localization. This principle applies with equal force to dental practice.

Our operator now watches his patient closely. He sees that the organs of elimination are functioning well, that plenty of liquids are taken by his patient so as to help the kidneys carry off the toxins, that his patient is resting quietly in bed and taking some light

liquid nourishment to build up the powers of resistance. He calls in a pathologist to make a blood examination. This is frequently significant. It is important in dealing with an infection to know whether there has been an altered quantitative relationship between the red and the white cells or whether there is a streptococcus hemolyticus strain present within the blood stream. Accordingly, the prognosis will be favorable or not, as this examination will disclose. A leucocytosis in all general infections is to be expected and is nature's defensive reaction to injury. But when there is an excessive rise in the white cell count, a leucemia is present, and here, of course, the prognosis is rather unfavorable.

But let us not forget our imaginary patient whom we left a moment ago with a swelling extending into the glands of the neck and the tissues of the floor of the mouth. Fluctuation is noticed. Our imaginary operator palpates the tissues and makes prompt incision for evacuation of the pus. The application of warm boric acid compresses has localized the pus and permitted surgical drainage. If the abscess is pointing externally, the drainage must be established on the face. It is futile to hope to discharge the contents of the abscess area intra-orally now. The patient's life is at stake; a scar is manifestly a minor consideration.

Let us return once more to our starting-point. Our patient has presented himself for the extraction, you will recall, of a mandibular third molar. Our anesthesia has been successfully induced. Our operator is ready to commence. He introduces his elevator between the second and third molars, using the adjacent tooth as a fulcrum to permit the delivery of the third molar. Several things may occur here to cause unpleasantness.

(1) He may loosen the second molar and cause a very painful pericemental condition to develop about that tooth.

(2) He may fracture off the crown of the third molar.

(3) He may fracture the jaw at a point extending downward from the contact area of the second and third molars.

(4) He may find a dry socket developing subsequent to even a comparatively successful extraction. This condition, which is really to be classed under necrosis, may lead to a succession of complications involving, progressively, severe pain, swelling, fever, pus formation.

(5) He may fracture and leave inside an apex of one or more of the roots.

(6) He may cause a particle of tooth or filling to slide down toward the base of the tongue and either lodge there temporarily or find its way down into the bronchus.

(7) His instrument may slip and cut a gash in the side of the tongue, or in the tonsillar tissues, or in the cheek.

In order that we may follow these points more clearly, let us take them up for consideration in the order in which we have detailed them. Their treatment and correction depend upon a realization of the nature of the accident, or shall we call it "mishap," of the operator.

First, the lever is a most valuable adjunct in dental practice. It may be also a source of the utmost grief. The injudicious choice of the fulcrum may

cause a loosening of the second molar by reason of too much stress directed against the distal wall of that tooth by the heel of the elevator, as the toe of the instrument is directed against the mesial aspect of the third molar for the lifting force. Personally, I have altered my technic within the last year to such an extent that I no longer utilize the second molar as a fulcrum to even the slightest degree. I find the buccal border of the mandible sufficient to afford me the degree of resistance I require for the delivery of the third molar.

Returning to our imaginary patient—perhaps his second molar has been loosened. He is suffering from a pain appreciated only by those who have ever had a sprained muscle or a blow on a bone. What treatment must we institute? It should consist of cold applications to the face, hot saline irrigations intra-orally, and internal medication with nerve sedatives. Should these not afford relief and the pathologic process become aggravated, the treatment would depend upon the particular symptoms. Suppuration may develop, and where our operator originally had to deal only with a pericementitis and a mild osteitis, he is now face to face with a suppurating osteomyelitis.

Our second complication which we mentioned was that of fracturing off the crown of the third molar. Now to some men this is not a very serious complication at all. To others it presents almost insurmountable difficulties. Fortunate is the operator who realizes his capabilities and limitations and desists from further operative measures and refers his patient to a specialist or to a brother practitioner who has had wider experience in such cases. But unfortunately there are some who will not yield, and the complications which may arise from misguided technic are apparent. The chisel-mallet force of the drill or the deep application of the beaks of the forceps for the engagement of the tooth leads frequently to traumatizing the tissues, hard or soft, which gives the patient no end of trouble.

The lacerated wound now calls for attention. How are we to treat this condition? I advise irrigation with hot saline solution, swabbing out the cavity with a soothing drug such as eugenol with some chloroform added to it for its slight anesthetic effect, dressing the cavity of the wound with a strip of gauze incorporated with vaseline and orthoform, anesthesin and aristol in equal parts. Exposed bone from which the periosteum has been stripped and which will slough off may be soothed by touching lightly with an applicator dipped into a concentrated solution of menthol and thymol crystals dissolved in trichloracetic acid or even in simple phenol. Some use a drop of lysol on the painful bone. The dressing is changed daily. In the early stages I advise the dressing of the wound twice a day, as the second visit late in the afternoon will afford relief for hours, lasting into the night, whereas the effect of the early morning dressing sometimes wears off and gives the patient no relief at night.

The patient is given sedatives to take internally. The nature of this medication depends on the severity of the symptoms. If pyramidon in five-grain doses does not ease the pain, then

codein sulphate, one-quarter grain, or morphin sulphate, one-eighth grain, will do it. I usually advise the patient to take ten grains of pyramidon every two hours until relieved. If no relief ensues after several hours, then resort to a more powerful drug, such as codein and morphin, as suggested. Should the roots, after much effort on the part of the operator, resist delivery, and the patient is still suffering much pain, with the tissues painfully traumatized, I advise palliative treatment. Continuance of the operation, whether by the original operator or by the specialist, at the time, cannot bring any more relief from pain than treating the wound as a wound, regardless of the presence of root fragments. Many operators feel that it is the presence of the root fragments that is responsible for the patient's severely painful ordeal. I find no immediate occasion to subject the patient to further operative experience for the time being. I want to impress upon you the fact that the pain is in the tissues and not in the tooth at this time, and to continue surgery is only to add more trauma, even though the surgeon be extremely careful. All bone is traumatized during the effort of a surgeon to remove a tooth. Do not be under the impression that trauma is limited to the procedure of a poor operator. It is just as closely identified as a phenomenon of the best surgical technic as is loss of blood. Our aim is purely to minimize both. That is good surgery—that is the ideal of surgery. Unfortunately we are not always successful or, shall I say, uniformly successful.

The third complication which may arise out of the operator's efforts to extract our imaginary patient's mandibular third molar is fracture of the jaw. This might be a result of leverage between the second and third molars, or forcep engagement of the third molar itself. Frail jaw bones housing large exostosed molars are sometimes fractured even by good operators. I am not speaking now of impacted teeth. I refer especially to the deep engagement of the third molar, even after the fracture of the crown has ensued. The treatment of jaw fracture is not complicated. Immobilization of the mandible to the maxilla by any of the accepted wiring treatments is the procedure to follow. Ice-packs on the jaw are advised ten minutes on and off to keep down edema to a minimum. If the fracture of the jaw takes place without the extraction being completed, I advise leaving the root in the jaw for future surgery, rather than continuing before the fracture is reduced.

Our fourth complication attending the removal of the third molar is a "dry socket." In these conditions the blood clot is entirely lost, leaving the alveolus empty and the bony walls exposed. Pain may persist for ten days or two weeks. Our patient must be kept as comfortable as possible with general nerve sedatives, taken internally, and local treatment of the socket, as follows: First, remove with a light curette the broken-down and infected contents of the socket. Irrigate well with hot normal saline, and then make a paste of orthoform, aristol, caroid powder and vaseline to be introduced into the socket on plain gauze. Change this dressing every day and, if possible during the first few days, twice a day.

The protection of the blood clot

immediately following the extraction of the tooth may help the clot to retain its vitality. Do not flood the socket with iodin. The wound does not need it. Iodin destroys the blood clot. Free application of normal saline solution to bruised mucous membrane surfaces has proved very beneficial in my hands. The wound needs no germicides. The general surgeon does not use iodin in deep surgery. He paints the skin surface and then is through with it. Sterility of instruments is essential. I hope I need not dwell upon that to you. I feel the mere mention of it is all that is required.

The fifth complication which we mentioned at the beginning was the fracturing of an apex of one of the roots of the third molar. This may occur even with every skilful operation. Extreme frailty and curvature make the fracture inevitable. The question of continuing the operation for the delivery of the apex is still open for discussion. My rule is as follows: If the tooth extracted was vital and if to endeavor to remove the small fragment would necessitate making a large opening in the jaw and the creation of an extensive wound, subjecting our patient to possible severe post-operative complications, I believe we may leave the fragment in the jaw with safety. Diseased root-ends should always be removed, unless they are left in the socket with the patient's full knowledge and consent for operation at a subsequent sitting.

Our sixth complication mentioned was the passing of a tooth or filling fragment of the third molar into the bronchus. This is a complication which requires a general surgeon. Its symptoms would be suggested by the patient suddenly indulging in severe coughing. X-ray examination should be promptly made. Hiding the fact from the patient constitutes neglect to use due care, which the law demands of us. The actual slipping down of the fragment does not necessarily constitute negligence per se. I favor the use of a throat curtain for all extraction operations, whether performed under local or general anesthesia.

Our seventh complication was the accident of having our instrument slip, cutting a gash in the side of the tongue, or in the tonsillar tissues, or in the cheek. The treatment here consists of passing a suture through the severed tissues, sufficiently deep to include any ruptured vessels.

A suppurative process originating in the alveolar bed of the third molar referred to may spread to and involve the deeper medullary substance of the mandible. One notices a thick greenish exudate. Treatment consists of waiting for the sequestration of the diseased tissue. Curettage is ill-advised, since spread of the suppurative process may follow. The application of ice packs to the face and irrigation of the wound with hot saline are the only measures to attend to other than keeping the patient comfortable. Checking up with roentgenograms is important so that the operator may determine when the sequestrum is ready to be thrown off. At this stage, if the opening of the wound intra-orally is too small, it is enlarged sufficiently to permit of its removal. If the fragment being thrown off is pointing extra-orally, the incision is made on the face to remove the sequestrum.

Having briefly sketched some of the complications which might attend the extraction of a mandibular third molar, let us now presume a bit and remove a maxillary first or second molar for our imaginary patient. Something might happen here which very frequently gives both the patient and the operator much trouble. I refer to the opening of the maxillary sinus to establish artificial communication with the mouth with or without the added misfortune of having a root fragment forced up into the sinus itself.

Communication of the sinus with the mouth need not disturb the operator unduly. I believe that closure of the opening by suturing the soft tissues should be done whenever possible. Otherwise light dressing of the alveolus to permit granulation at the floor of the sinus is the treatment suggested. Should a root be forced up into the sinus, the treatment is more or less involved. Sometimes it may be expelled by having the patient blow air through the nose into the sinus, holding the nostrils shut with the fingers. If this fails, it is well to enlarge the alveolar communication and again try to blow the root out by holding the nostrils. Failure this time means that it is necessary to enlarge the opening further buccally in order to afford entrance for exploratory instruments such as the loop curettes. Some operators look with disfavor upon the method of enlarging the alveolar opening because there is sometimes a disagreeably larger opening remaining after the healing process has been completed. They find it preferable to disregard the molar avenue and enter the sinus through the canine fossa. The advantage of this operation is that of permitting more effective visualization of the sinus cavity as well as more favorable closure after the operation. Both operations have their place. I believe that irrigation of the sinus through the naso-antral wall by a rhinologist is frequently indicated following antrum operations through the mouth. A closer cooperation between the dental and medical practitioners in these cases can lead only to a better operative result for our patient. Future complications from the development of polypoid growths in the sinus may thus be avoided. It is well to remember that polypoid tissue, a low-grade granulation tissue, may suppurate and give rise to a condition known as antral empyema.

A condition which sometimes makes itself manifest following the extraction of teeth is ecchymosis, or a discoloration of the skin due to extravasation of blood. This disappears after due time. Vetter* advises the use of ammonium chlorid in water, a pinch of the salt to four ounces of water, locally on a pad to hasten its disappearance.

There are certain landmarks in the mouth which it is well to bear in mind when operating, lest we do injury to tissues which may result in either excessive hemorrhage or lasting anesthesia. I refer to the mental foramen, the mandibular canal, the naso-palatine foramen, the anterior palatine canal, and the lingual nerve. Any of these tissues may be trespassed upon by a too ambitious use of the instrument during the operation. If one bears in

* *Post-Operative Complications and Their Control,* Charles Vetter, *The Dental Cosmos,* May, 1926.

mind these facts, one will, unless unusual anatomical conditions are present, avoid their injury.

It is also well to remember that when a tooth fractures, it is not good surgery to keep insisting upon reaching down with the beaks of the forceps over the outer and inner alveolar plates. Injury to the adjacent teeth or, as in the case of the maxillary third molar, fracture of the tuberosity may and frequently does ensue.

A healing wound will frequently show unhealthy granulating tissue protruding from the surface. This is due to irritation from some alveolar fragment. It does not symptomatize sepsis, even though as in some instances pus is exuded freely, or on slight digital pressure. Nature's effort to dislodge a bone fragment is to liquefy it.

The operator should endeavor to enter the area with the cautery a few times. This causes no pain unless the patient is extremely sensitive. A light curette will usually remove painlessly all soft and broken-down granulating tissue. The patient is kept under daily observation and the same treatment repeated until the wound shows a smooth mucous membrane. If such a wound, which occurs only rarely, however, gives the patient pain, a light gauze dressing dipped in vaseline and orthoform-aristol mixture will give relief.

I find it a good policy to enter such a wound with an applicator wound with absorbent cotton. I rotate the applicator a few times and endeavor to note whether the shreds of cotton catch on a rough bony wall. It is thus easy to learn when a smooth alveolus indicates that our repair process is progressing favorably.

Suppurating wounds respond nicely to the local application of 1% acriviolet solution. A tablet of acriviolet is dissolved in one ounce of hot water in my office once a week for this purpose. The solution decomposes if kept longer. It is well to keep the acriviolet in contact with a suppurating wound for one minute. Acriviolet destroys pathogenic organisms without injury to soft tissues or to the blood clot.

Dressings should always be introduced without much pressure unless we are to control hemorrhage. One hears the term *packing* too frequently. It is well to give some heed to the distinction between a packing and a dressing. Much post-operative discomfort might be avoided if the gauze were introduced as a dressing rather than as a packing.

Local anesthesia is frequently responsible for much post-operative discomfort. The cause is not always definite. Sometimes it may be a result of needle trauma, sometimes it is a result of intercellular pressure of the liquid of the anesthetic solution, and then again it may be a result of localized reduced resistance. During the period of anesthesia and lessened blood supply to the area of operation the tissues are subject to infection.

Injection of the anesthetic solution into or near an area of suppuration may bring on local or diffused sepsis. While the operator may employ nerve-blocking anesthesia, he may also resort to a supplemental infiltration around the area of localized edema to obtain a deeper anesthesia, thus encouraging a septic process.

A word with regard to swellings may be pertinent to this paper. Frequently the operator is blamed for post-operative complications for which he is in no way responsible. For instance, a child is brought in with acute cervical adenitis. Every surface indication of a dental infection is present. Even in the region of the swelling are carious teeth. As a matter of fact, if the operator will observe closely, he will note in these cases no swelling of the soft parts about the carious teeth nor any tenderness to percussion on the teeth. He removes the teeth. The adenitis progresses and the child is taken to the surgeon with a history such as this: "My child had a tooth extracted last week and the face is more swollen since then, Doctor." The all too unfriendly medical profession will frown upon this questionable dental practitioner and the lay gossips will spread the news locally in the community. My rule in these suspicious cases is: make sure that the swelling is caused by a tooth before extracting it.

Another aspect to the case of a swelling about a tooth is pertinent. When a patient presents with acute purulent osteitis—that is, the old-fashioned swollen face—it is important to decide whether the extraction of the offending tooth is sound policy for other than scientific considerations. Frequently an external drainage on the face must be established in connection with acute infections about the jaws. The laity and, to my mind, the medical profession have been misled into thinking that the necessity for the occasion to incise the abscess on the face arose from some faulty technic on the part of the dentist at the time of the extraction of the tooth.

At the recent New York State Dental Society convention at Rochester, N. Y., Dr. Chalmers J. Lyons of Ann Arbor, Michigan, made the following statement on the question of whether to extract a tooth while it is subject to acute pathologic disturbances: "If there is reasonable assurance that we can establish drainage by the extraction of the infected tooth, it is safe to extract; otherwise it is better to make intra-oral incision for drainage and, when the acute svmptoms have subsided, to extract the tooth." (The language is perhaps not exactly as set down by Dr. Lyons, but I can vouch for the substance.) Now, Dr. Lyons has made a reasonably clear statement, but it needs modification for the general practitioner, and I believe that I can make the rule fool-proof.

I believe that if there is any danger of the abscess requiring external drainage, it is unwise to remove this tooth so that there will be any lay misconceptions as to the infection having been a result of the extraction. Our patients are frequently ignorant on other matters of life besides dentistry, and only too frequently even intelligent people are woefully ignorant of dental problems, regardless of the state of their mental enlightenment elsewhere. It is better to play safe and make an incision for drainage, as Dr. Lyons states, but I amend his suggestions by saying, "Do it in all cases where there may be external pointing of the abscess."

When a tooth is the seat of acute pathologic changes in the investing tissues, my rule is never to extract if in the operation to deliver the tooth it

may be necessary to traumatize the tissues considerably. Such a tooth should be removed only in the presence of active inflammation and soft tissue suppuration if it can be removed without injury to its investment. To remove such a tooth when it is firm and well embedded in the alveolar process, possibly even exostosed or curved, may invite fracture, and the effort to dislodge the roots thus fractured in the presence of the acute purulent osteitis may lead to very embarrassing developments. Since it is impossible to tell when an abscess is walled off, the infection is subject to urgent invitation to make inroads upon neighboring healthy bone and give rise to serious septic symptoms.

In conclusion, my word of advice to the general practitioner is to be very cautious about every step in the practice of exodontia. If one is not equipped to complete an operation, it were better policy never to commence it unless the operation presents in the nature of an emergency. I am not taking the position that a general practitioner should refer all his extraction cases to the specialist, but I do take a definite stand that, with few exceptions, one should hesitate to commence what one knows in advance one is not equipped by reason of experience to complete. If one makes this the policy in the management of a general dental practice, there will be fewer postoperative complications to bring misery not only to the patient but to the dental practitioner himself.

730 Fifth Avenue

Dental Caries and Pyorrhea*

Another Approach

By F. W. BRODERICK, M.R.C.S., L.R.C.P., L.D.S.

Having been given the opportunity of bringing to the notice of the readers of *The Dental Magazine and Oral Topics* an unorthodox view of the causes of the two primary diseases which we as dentists are called upon to treat, viz., dental caries and pyorrhea, in a series of articles, each of which must be more or less complete in itself, although connected with one another through a continuity of ideas, I feel that a certain amount of latitude must be allowed me in the form that these articles take, and that I must be permitted to approach my subject in a manner that is perhaps unusual, viz., that of stating my conclusions first and leading up to the reasons behind those conclusions afterward. It seems to me that this is the only way in which I shall be able to sustain interest, for a good bit of the subject matter may appear at first sight to be somewhat remote from the end in view unless it is understood to what point it is tending.

The Theories

I will therefore commence by stating my submissions in the following terms: In the compensation of a tendency to an acidemia there is a drain on the available alkali in the body to neutralize the excess of acid; in which circumstances lime salts that are usually provided for such purposes as stabilizing the alkalinity of the saliva, and through this of hypercalcification of the teeth, or of providing the necessary salts for bodily repair and replacement and all the other purposes for which calcium salts are required to keep the organism in health are no longer available; then, if local circumstances are favorable, a very definite breaking down of tooth tissue will result, which will terminate in that condition which we designate as dental caries. And, secondly, the etiological factors in the production of pyorrhea alveolaris lie in a tendency of alkalemia, in the compensation of which conditions will become favorable for the deposition of tartar around the necks of the teeth in the subgingival trough. As a result of the irritation which this calculus will bring about, there will occur a marginal gingivitis that will predispose those tissues to infection by any microorganisms that inhabit the mouth, and the clinical condition is the normal result of this infection.

Back to Fundamentals

Having stated the theories, it will at once be obvious that they deal with general rather than with local and environmental conditions, and that it will be necessary to delve somewhat deeply into certain physiological and biochemical details in their consideration. We are, in fact, taken right back to the consideration of disease in general and the factors on which depar-

* Reprinted from *The Dental Magazine and Oral Topics*, June, 1929.

tures from health depend and must realize that what is ordinarily termed dental pathology is in reality only a local application of general pathology and not a specialized branch of that science; that the same rules hold good for disease of the teeth and surrounding tissues as for disease elsewhere in the body, modified only because of the special structure and the special local environment of those organs.

Now, primitive man believed that all disease resulted from the presence of some extraneous substance or personality which had found entrance to the body in response to the wishes of some offended deity or personal enemy. In more modern times this extraneous substance has been discovered to be bacteria and their products. To this cause has been added the absence from the body of some hypothetical substance called a vitamin, the presence of which is essential for perfect health. Treatment has consequently been directed toward the removal or the neutralization of the first and to the addition of the lacking substance in the second, viz., the vaccine or the orange juice. This is all so simple and so easy that it is almost a pity that it is not true. It seems unfortunate, perhaps, that the whole matter of disease cannot be summed up in the simple formula of some enemy needing removal or of something absent needing administration.

Other Important Factors

There are, however, other factors of importance in the consideration of the origins of disease, into which neither an added element nor the lack of some essential factor enters at all, namely, the alteration of function of some organ which will tend to upset the necessary processes of life, and the effects of the power of compensation and adjustment that the body possesses to make the best of circumstances which may not be the most satisfactory for its most perfect functioning.

It so happens that in consideration of the etiology of dental disease both bacteriology and vitamin deficiency have received attention, but these other factors have been neglected, an error which I have attempted to rectify, and which in a recently published book I believe to have shown to have a distinct bearing on the subject of dental research.

The Disappointing Results of Research

I would suggest that the disappointment that has resulted from all researches into these questions arises not so much from wrong methods or inherent difficulties as from a wrong conception of just what is being sought. As a result, probably, of the specialization of dentistry, the importance of a tooth as a tooth rather than as a very definite organ of the body has been stressed and its relation to the rest of the body has been minimized. The very words *dental disease* in themselves, in so far as they suggest the possibility of special disease entities with no connection whatever with other and distant organs of the body, have limited the outlook and warped the imaginations of research workers, turning their ideas into narrow and unproductive channels.

Clearer Idea Wanted

I believe that this whole visualization is incorrect, and that until we get a

clearer idea of the body in health and disease than is presented in the classification of dental conditions in the textbooks our task will never be satisfactorily accomplished. It is there suggested that dental caries is a "disease" of the teeth and that pyorrhea is a "disease" of the supporting tissues of the teeth, that both the one and the other are separate and distinct disease entities having no connection with and being in no way related to upsets elsewhere in the body. Further, in the ordinary visualization of the dentist any conception of a relationship between dental "disease" and malfunction elsewhere is that of cause and effect, and the idea that one and the other may be more intimately connected through some common underlying circumstance which is the causative factor of both does not seem to enter. The suggestion that dental caries, for instance, may be but one part of a disease picture and not a disease in itself has not been brought forward.

THE ENDOCRIN APPARATUS

The discovery of the hormones of the endocrin glands and the appreciation of the fact that it was possible to get changes in all or a very large number of organs as a result of a malfunctioning of one single gland through the fact that the secretion of that gland affected every part of the body opened the eyes of physicians to the fact that the chemical processes of the body which the endocrin apparatus regulated were of immense importance in the general economy of the organism. The science of biochemistry thus inaugurated has to a very great extent revolutionized the conception behind the origins of disease, and we are now beginning to realize that this is not a question of an upset of this or that organ so much as a reaction of the body as a whole, first of all in response to some more or less localized trouble, followed by a reshuffle and alteration of functions so as to allow the processes of life to continue in spite of some handicap thus brought about.

This is the line that I propose to follow in this series of articles, and I believe that I shall be able to demonstrate that there is a great deal of evidence to show that "diseases" of the teeth are not dissimilar in origin to diseased conditions elsewhere in the body.

The whole matter, therefore, hinges on what is meant by the word disease, or, if we take this as signifying a departure from perfect health, as to what is meant by health.

I have suggested that essentially health is the result of a perfect adaptation of the individual to his environment. Disease, then, signifies the result of a maladaptation to this environment.

This is a very wide definition, certainly, and could be made to include an entirely local cause for dental caries along quite orthodox lines, if a sweet-shop be within the environment; but it would have to be allowed that there was something allied to original sin in the desire to visit the sweet-shop—a sin, moreover, to which an adult was more or less immune, whereas a child was very susceptible—and to this idea I cannot subscribe for reasons that will be explained as I proceed.

REACTION OF THE BLOOD

From the statement of the theories

given above it will be seen that the function of the body that I wish to consider is that which stabilizes the reaction of the blood, in that I have connected dental caries with a tendency to an acidemia and pyorrhea with that of an alkalemia. Now this reaction is a very stable affair, and alterations therein are possible only within very narrow limits if life is to continue. For instance, the difference in reaction between distilled water on the one hand and ordinary tap water on the other would be fatal if it occured in the blood, and alterations well within these limits would produce very serious symptoms of upset in bodily function.

Notwithstanding this necessity for stability of reaction, however, the very processes by which and through which life is carried on necessitate the production of acids and alkalies which, passing into the blood stream, are constantly tending to alter this reaction to the one or the other extreme, and these products of metabolism must be dealt with if their presence is not to embarrass the individual in the business of living.

Buffering Power of the Blood

It is not possible or even desirable in the course of a magazine article to go fully into the mechanism by which this stability is maintained. It will be sufficient if the principal features are mentioned. The most important of these lies in what is known as the buffering powers of the blood, by which is meant the power of the blood to take up a certain amount of either acid or alkali without any perceptible change in reaction. This power the blood possesses through the various salts which it contains, the phosphates and the carbonates, the former being in the form of mono-sodium phosphate and di-sodium phosphate (NaH_2PO_4 and Na_2HPO_4), which are present in such quantities that the mixture forms a nearly neutral solution, with the result that in order to alter this reaction it is necessary to add sufficient acid to convert all the di-sodium into mono-sodium phosphates or sufficient alkali to convert all the mono-sodium into di-sodium phosphate before any change takes place. Any quantity short of this will have no perceptible effect on the reaction. In much the same manner the CO_2 in the blood bicarbonate enables the blood to take up even strong acids without material change.

Actions of Kidney, Lungs and Liver

In addition to this buffering property of the blood, and acting in conjunction with it, are the eliminative powers of the kidneys in abstracting from the blood either acid or alkali, as occasion requires; the elimination of CO_2, which is an acid gas, by the lungs in respiration; and the liver action in separating out ammonia, which is an alkali, from the proteins of the food and the utilization of this in cases of necessity in the neutralization of acids.

This mechanism, therefore, comprising buffering, elimination and neutralization, is sufficient in all ordinary cases to deal with the usual and normal production of acid or alkali which results from normal metabolism. If, however, either the mechanism is inefficient or the amounts of acid or alkali formed are excessive, trouble will ensue and a tendency exist toward an acidemia or an alkalemia, as the case may be.

When Excessive Acid Enters the Blood

If, for example, the amount of acid that enters the blood be excessive and strains the buffering powers of the blood beyond a certain point, there will arise an alteration to some slight extent in its reaction and acidemia will become an established fact (that is to say, there will result a passing over of the reaction toward the acid side of the normal, though, of course, this does not become definitely acid, a circumstance incompatible with life). As a result of this, definite symptoms of distress will manifest themselves, among which will be an exaggeration of nature's methods of maintaining the balance. For example, there will occur a great increase in respiration, the result of the necessity of eliminating an increased quantity of CO_2 in a given time. In addition, the kidneys will commence excreting an additional amount of acid, and these symptoms will continue until such a time as equilibrium of acid to base is regained. This is seen in cases of excessive muscular exertion, such as running for a tram, a circumstance usually followed by a panting called shortness of breath. In reality this is not so much a shortness due to diminished oxygen as an excess due to a desire of eliminating an extra amount of acid CO_2.

These are, however, the acute cases and as such are not of such importance to us in our present consideration as are the more chronic ones. In these the constant tendency to an acidemia due to a slightly excessive increase of acid or diminution of alkali brings about a slightly increased respiration and a slightly increased elimination by the kidney and results in a definite shortage of alkali, in that acid can be eliminated only as a salt and takes with it a proportion of alkali which is thus lost to the body, and the buffering powers of the blood are reduced to that extent.

The Beginning of a Vicious Circle

Here, then, is the beginning of a vicious circle, the continual increase in acid formation leading to an increased difficulty in dealing with that acid, with the result that there is brought about a state of chronic alkali shortage, including among others those of calcium. Although in these cases there may be no symptoms of the acidemia, in that there is no change in reaction, however minute, owing to the compensation being perfect, this is brought about with difficulty and at the expense of salts required for other purposes. These, having been utilized for a more immediately essential reason, are no longer available, and consequently there will result changes throughout the organism, the direct result of this loss.

Put quite simply, this is the visualization of the circumstances behind dental caries that I desire to bring to your notice, and I would point out that here we have the two methods of the production of disease mentioned above, an upset function and its compensation.

The obvious questions that the sceptic will ask will be: Why is it necessary to have a new visualization at all? How do these circumstances of alkaliplenia arise, and have these any relationship to the incidence of dental caries? How does this condition of calcium starvation bring about the destruction of the

teeth? These three questions I will attempt to answer.

Miller's Theory

In the first place, although I accept the theories of Miller that destruction of the dental enamel arises as the result of acids formed by the fermentation of carbohydrate foodstuffs on and around the teeth and believe that this accounts for dental caries in susceptible individuals, I cannot agree that these theories explain the whole circumstance. If the matter is as simple as this theory would suggest, then the extraordinary thing is not that caries is rampant, but rather that it is not absolutely universal, that it is possible to reach adult age and still possess teeth. Carbohydrate food is and must be consumed by all, for it is from this principally that energy in all its forms arises, and it is a most important constituent of the diet, especially in children. Combined with this, it is an almost physical impossibility to keep an absolutely clean mouth under modern circumstances, consequently there must be fermenting carbohydrate in every mouth for at least some part of the day. Yet we do find some teeth that are immune to caries, and some mouths—and these by no means the cleanest—in which there is no suggestion of decay. Furthermore, the amount of carbohydrate consumed cannot influence the problem if it is only a question of the local action, for a little will ferment as quickly as a lot, and, so long as there be sufficient to hang around the teeth, they should be destroyed by this as certainly as by the greater quantity. It would seem, therefore, that reducing the carbohydrate intake to a minimum, even if we were able to estimate this minimum, which we cannot, as I shall show later, does not in any way help in caries prevention. In addition, local causes of caries will not explain the age incidence of the trouble or, what I believe to be a most important factor and one which I shall consider in another article, the antagonism between caries and pyorrhea.

All these difficulties and others which I have no opportunity to deal with at this time necessitate a hypothesis which will take into account the matter of susceptibility, without which the exciting causes of carbohydrate fermentation will avail nothing.

The Vitamin Hypothesis

Mrs. Mellanby invokes the vitamin hypothesis to explain this immunity from or susceptibility to caries and points out that with a deficiency of Vitamin D during the prenatal period and in early life there exists faults in calcification which will predispose to tooth destruction. She has demonstrated that in these badly formed teeth the incidence of caries is greater than in others more highly calcified and in addition has shown that, provided that the diet improves in later life in this special particular, even these badly formed teeth withstand caries better than more perfect specimens with a bad diet. This, if I read Mrs. Mellanby aright, means that the calcification of the tooth is the important feature in its preservation. With these ideas I am in sympathy, but there exist many difficulties, clinical and otherwise, in accepting them as the only or even the most important factors in the problem. Further, I believe that

Mrs. Mellanby's experiments can receive another interpretation.

Black's Belief in Environment

Black, on the contrary, believes that the state of the calcification of the teeth is a matter of no moment whatsoever in their preservation, but that the question of their environment is all-important. He contends that a good tooth in a bad environment will decay, whereas a poor tooth in a good environment will not. With this visualization I am also in sympathy and do not believe that the two are of necessity antagonistic, in that I suggest that the whole question of calcification, or rather of hypercalcification or decalcification after eruption, is a matter of environment.

I suggest that the clinical facts which are unexplainable by either Black's or Mrs. Mellanby's hypothesis become clear when read in the manner put forward by myself.

Alkaliplenia and the Incidence of Caries

Passing to the second question: How do conditions of alkaliplenia arise, and have these any relationship to the incidence of caries?

The answer here lies in the consideration of metabolism, that function by which potential energy, the result of the intake of food and oxygen, is converted into kinetic energy as represented by muscular exertion, gland secretion, thought and action in all its varied forms. It so happens that the processes of life can be accomplished only in an alkalin medium, whereas, as we have seen, these themselves in their accomplishment produce quantities of acid; and this acid production must not be sufficient to reduce the general alkalinity of the body beyond a certain point. We have to consider all those factors which may affect the overproduction of acid or the underproduction of alkali.

Diet

It will be obvious that the first item needing consideration will be that of the diet, for from this must be provided all the constituents other than oxygen which will be needed for such functions as growth and development and the repair and replacement of tissue which is constantly going on, for it must be understood that the constituents of all the cells in the body are constantly being changed and replaced throughout life, with a possible exception of those of the dental enamel.

Now, in the metabolism of the various foodstuffs, that is, in their breaking up into their more elemental substances before they can be utilized, certain changes take place, in the course of which there are formed certain acid or alkalin salts, according to the nature of the food, which may, if in sufficient quantity, throw a strain upon the regulating mechanism of the blood and so tend to bring about an acidosis or an alkalosis.

We have, therefore, several circumstances to consider: first, whether all the necessary elements are present in the diet in sufficient quantity; second, whether in their metabolism certain difficulties may not arise which will bring about their excretion unutilized owing to their being commandeered for purposes essential for the preservation of life, but for which they were not intended; and, third, whether any circumstances exist which militate against their

being absorbed at all. This third difficulty I shall have to leave until another occasion.

Two Main Categories

From the point of view that we are considering, the various articles of diet group up into two main categories, the meats and the cereals giving an excess of acid over alkalin end-products of metabolism, and the vegetables and the fruits an excess of alkalin over acid. It is known, for instance, that a completely vegetarian diet throws no strain whatever upon the regulating mechanism of the blood from excess acid production. In herbivorous animals the function of ammonia formation for neutralization purposes is not utilized at all, whereas the more proteins enter into the diet the more this function becomes in evidence. In the mixed diet of mankind, so long as the various elements, vegetarian and flesh, are mixed in proper proportion, all may be well, but if the latter tend to overbalance the former there will result an overproduction of acid that may lead to disaster.

In these circumstances there will be a strain upon the regulating mechanism which may lead to an acidosis, with a resultant diminution of available alkali, as a result of which shortage certain changes will take place which will eventually show themselves in various parts of the body.

Where a large intake of cereals is an additional feature of the diet, other factors enter into the equation. Not only is there an additional tendency to the production of acid, especially if the cereal replaces the vegetable rather than the meat portion, but also, on account of the shortage of the mineral constituent of this food, a definite mineral starvation may come about.

A Conclusion Disputed

Bibby, correlating diet and dental caries, sums the matter up as follows: "It is found that those races whose diet includes no cereal, of which the Maori and the Esquimaux are examples, have teeth notably free from caries; those who eat cereals, but little meat, and supplement what cereals they do eat with a large proportion of fruit and vegetables, or both, have teeth of the type of the Irish peasantry and the vegetarian races of the East; finally, those races whose staple diet consists of cereals and meat, supplemented by relatively small quantities of vegetables and fruit, have teeth and jaws such as are seen in this country."

The matter, however, can hardly be summed up in this manner, for just as the completely carnivorous animal is enabled by its special constitution and bodily function to deal with an enormous quantity of acid formed in this manner, a quantity that would very rapidly kill an herbivorous animal not so constituted, so, I would suppose, the inherited powers of different races would differ in this respect; consequently it is not necessarily a fair argument to compare diets and dental disease in completely different races. Further, the same argument of constitutional ability to deal with excess acid will apply in a less degree to individuals of the same race, a matter that I shall discuss at a later date.

The fact, however, remains that the question of diet in the production of alkaliplenia is one of great importance.

Overfeeding and Underfeeding

It will be noticed that it is the foodstuffs that give an excess of alkalin end-products of metabolism and which are therefore the most useful in preventing an acidosis than are those which are rich in Vitamin D, and also that the cereals, which are principally condemned by Mrs. Mellanby as containing "antocalcifying factors," in addition to having no vitamin, and giving an excess of acid have an additional disadvantage of being short in mineral matter. I would sugggest, therefore, that there is no necessity to hypothesize another factor, an anti-, to account for the harm that results from an excess of these foods in the diet, but that these reasons taken together are quite sufficient to account for her results.

As in the consideration of metabolism the important factor is the balance between intake and output, before leaving the former, quantity as well as quality must be taken into account. Here the question of overfeeding or underfeeding enters into the equation. In the former any excess that cannot be utilized as some form of energy or stored in the body for future use becomes a danger, in that it tends to break down insufficiently and in this process to form semi-oxidized products, which, being mainly acids, in neutralization waste alkalin salts by elimination. In underfeeding also, especially if this includes carbohydrate, an excess of acid products results on account of the difficulty in these circumstances of metabolizing fats.

The Output of Energy

Passing to the other side of the equation, the output of energy, it is obvious that here also there is a possibility of imbalance, in that the effect of all energy formation is the production of acid. Consequently, whether this be mental or physical or physiological, if it tends to be excessive, it will result in a shortage of alkali available on account of the fact that this has been utilized to deal with excess acid. It must be remembered, in this consideration, that such a condition as emotional excitement is a great expender of mental energy, and that in children who have not yet learned to conserve in this direction there exists a great danger from this cause of a condition bordering on an acidosis. This fact is now recognized in medicine, and it is understood that the bilious attacks that are so apt to follow any special excitement in small children are brought about through this cause.

Another example of increased expenditure of energy will be the reaction of the body to an acute infection where the anabolic activity, the collection and storage of material, the one side of the equation, is almost at a standstill, whereas catabolic activity, the spending of that collected material, is going on at a great pace. Here the overproduction of acid may be considerable and the presence of an acidosis almost certain.

Two other conditions, out of several, I should like to mention in this connection as the possible cause of a tendency to an acidosis, viz., pregnancy and the taking of an anesthetic.

It has long been known that a tendency to an acidosis is not uncommon in pregnant women. Whether or not this will be a matter of importance

will of course depend upon her powers in the non-pregnant state of dealing with some increase in acid formation. If this is good, then the chances are that the additional tendency brought about by her condition will not be of much consequence. If, on the other hand, in ordinary circumstances she has some difficulties in this direction, if she is living, so to speak, on the edge of an acidosis, then it is probable that the additional strain thrown upon her regulating mechanism may be sufficient to bring about this condition, and her alkali reserve be by that much diminished.

With regard to the question of anesthetics there is no doubt whatever that the administration of these does very materially increase the acid production, and that in the majority of cases a more or less severe acidosis results, unless steps are taken beforehand to prevent this.

Correlating these facts with the times of incidence of dental caries, we see that the times and circumstances in which there will exist this shortage of alkali are the very times and circumstances in which caries is most likely to occur.

Kirk has said: "Every practitioner knows that susceptibility to dental caries is a thing that comes and goes. So clearly and so broadly is this fact recognized that it is generally conceded among dentists that youth is the period of the greatest susceptibility, and that, *given normal conditions of health,* this tendency is markedly diminished, if indeed a period of immunity does not normally supervene when adult age is reached. It is also a well established fact that pregnancy tends to inaugurate a period of susceptibility . . ."

Returning to our equation, the balance between intake and output, between anabolism and catabolism, we shall see that in childhood and youth there must be an excess intake, a gain on balance in anabolism, so that growth and development may take place. It will at the same time be realized that the output of energy at these times tends to be excessive, especially so in certain types of children who have so much to do, so much to learn, such enormous interest to take in all that is going on around them, and who have not yet learned to conserve their energies. Consequently it is not difficult to see that, as both sides of the equation may be strained, a breakdown may occur which can only result in a tendency to an acidosis with its resulting alkaliplenia.

When adult age is reached, the tendencies to an upset balance are much less noticeable. Here anabolism and catabolism go more nearly hand in hand; the necessity of collection and storage being much less, there is less likelihood of a breakdown in that direction, the emotional excitement and excessive physical exertion of youth are no longer so urgent, and the tendency toward acidosis is practically nonexistent.

Thus, leaving out of account for the moment exceptional circumstances, we see that the period of life in which dental caries is most usual is at the same time that in which the tendencies to a shortage of available alkali are most easily brought out.

As there would seem to be some difference of opinion as to the effect of pregnancy upon the teeth, I should

like to give my reading of the matter, as it is not foreign to the present discussion.

Kirk says: "For every child a tooth," whereas Ziskin, having considered some statistics of caries in pregnancy, says: "Hence the conclusion that pregnancy, *per se*, is not a cause of dental caries. I would suggest that caries in pregnant women is due to the same cause as caries in non-pregnant women." With both these statements I would agree, but when on the strength of the latter Leon Williams says, "And so disappears another dental myth," I would certainly not agree. The matter is not so simple that it can be dismissed in this manner. For while it is agreed that the cause of the caries remains the same whether the woman is pregnant or not, may it not be possible that the factors behind the caries, though the same qualitatively, may be altered quantitatively? That a woman who in normal times is enabled to balance acid and alkali without difficulty may, as a direct result of the additional strain of pregnancy be unable to do so, and that in these circumstances there will occur a tendency to an acidosis, and consequently to dental caries?

The answer to the third question, how does this condition of calcium starvation bring about dental caries, I must defer to the next paper.

(*To be continued*)

[FINISHING THE PROCESS]

Granting that many criticisms are soundly based, the fact remains that the results of a conservative operative procedure in mouth preparation are overcoming much of the adverse criticism, and requests for this operation by men recognized as authorities in the restorative field seem to be overshadowing the severe criticisms which have been so prevalent.

—MILLER.

Prevention and Its Significance to the Dentist

By F. ALBERT DONLAN, M.D., Atlantic City, N. J.

(*Continued from August*)

Local pathology may be primarily congenital, as inharmonious occlusion. General manifestations may be slowly evidenced, vague in symptomatology and destructive in effect. Whether biologic or acquired, limited or general, the resultant effect will be the same. Weeks or years after systemic bacterial disease has subsided, oral pathology not infrequently follows. Obstinate or vague oral pathology resistant to treatment is frequently associated with metabolic or endocrin disease.

The gingiva is composed of connective tissue covered with mucous membrane. The epithelial cells in this locality are resistant to irritation and bacterial invasion. The gingiva is festooned about the neck of the tooth (the cemento-enamel junction) and fills the interproximal spaces. The peridental membrane depends to a large extent upon the gum for nourishment. Its passage from the gum to the neck of the tooth, thence to the alveolar space, where it becomes the periosteum, is imperceptible. In health the color of the gingiva should be uniform throughout. Lightness or paleness suggests anemia, while darker shades suggest hyperemia. A change in color is frequently an early manifestation of beginning pathology.

The natural or normal form of the teeth is an expression of the force of adaptation. Each design is peculiar to its position and function. The series is mutually dependent and subject to biologic tendencies. As a complex mechanism embracing many functions, the tooth is subject to many influences productive of untoward effects.

Of basic importance in oral medicine is an understanding of the phenomena of occlusion and mastication. The conduct of the latter is directly dependent upon muscular balance and the geometrical precision of the former. When conduct is contrary to normal, whether the cause be congenital or acquired, it is inharmonious. A destructive process rather than a productive one will be the result.

A single impairment may be the result of contagious disease or anatomic imperfection, trauma, imperfections in restorations executed without due respect for the organism as a whole, muscular imbalance, innervation or habit, rickets and hereditary syphilis, disturbances of the salivary glands, injudicious extraction of the temporary or permanent teeth, supernumerary teeth, anomalies of the teeth, frenum, palate and maxilla. Anything responsible for lack of coordination will impair function, and the perversion will maintain a pathologic tendency until corrected.

Frequently a lisp, a hiss, an effort to enunciate reveals the presence of inharmonious function. In overcoming any disturbance of function the thought must be uppermost in the mind that the tooth is an organ whose

normal function is necessary for digestion, tissue vitality, economical and social success.

Many individuals are peculiarly susceptible to caries. Irrespective of what causes have been mentioned there is no specifically defined etiological factor. Opinions are divided as to whether the phenomenon is necessarily a local infection or an infection originating elsewhere. Duration, susceptibility to recurrences and individual resistance are factors which must be considered in the study. Kirk states: "Acid saliva, even if the acidity is due to lactic acid, will not give rise to decay. The destruction is effected by bringing about a decalcification of the teeth known as chemical erosion of the teeth and not necessarily dependent upon bacterial activity." Black declares: "Decay of the teeth is a factor of the environment." Grieves advises: "Essential maintenance of a calcium and phosphorous balance in the diet for good tooth structure."

Charles E. de Sajos states: "We have another frequent cause of caries—syphilis—and it does its main harm in my opinion through its debilitating influence upon the endocrin glands. In hereditary syphilis, in which caries is frequent, the role of the thyroid is so marked that treatment during pregnancy may overcome the evil influence of the disease on the offspring. Tuberculosis, which also favors caries, is known to deplete the activity of the body in phospho-lipoids. The caries brought in by acute infections is not only the result of a similar state but is also due to the exhaustion of the various endocrins."

Stomatitis is a term used to designate any inflammation of the mucous membrane of the oral cavity and is classified according to anatomy, pathology and durations. It is either acute or chronic, local or diffuse. When the gums are involved, it is known as a gingivitis, and when the tongue is affected, a glossitis. Distress may be anything from discomfort to severe pain. The saliva may assume a tenacious nature and become excessive or deficient. A tendency to bleed with slight cause is common in all forms. Children and the debilitated are susceptible. Overcrowding in institutions favors it. During the eruptive period of life there is a reactionary or functional inflammation. Reflex symptoms (gastro-intestinal and convulsions) observed in children and those in adults (eye disturbances, earache, trismus and bronchitis) with eruption of the teeth are examples.

The simpler forms of acute stomatitis consist of small erythematous patches, few or numerous, the degree of hyperemia varying. In the event of cellular or fibrinous infiltration the papilla or erythematous areas become elevated and, as the disease progresses, tend to bleed and ulcerate. Depending upon the etiology there will appear exudates, false membranes, ulceration, suppuration and sloughing. The general appearance of stomatitis is often an indication of the susceptibility to or the presence of systemic disease.

A specific bacterial cause of stomatitis has not been determined or isolated. Many of the more common bacteria found in association with the lesions, such as staphylococci, influenza bacilli, pneumococci, streptococci, typhoid bacilli, certain leptothrix, etc.,

are answerable. The ulcerative form of the disease prevails epidemically in unhygienic institutions, tenements and camps.

Thrush usually begins on the dorsum of the tongue and is characterized by small white spots which coalesce. The patches, resembling curdled milk, readily detach and reform. They change to a yellowish and then to a brownish color. The lesion occasionally penetrates to the basement membrane.

Aphthous stomatitis (canker sore) appears singly or in groups and consists of superficial erosions or ulcerations surrounded by an inflammatory zone. Vesicular elevations break down and leave a shallow, painful ulcer. The lesions are commonly observed at the tip or edges of the tongue or inner aspect of the lips and cheeks.

Ulcerative stomatitis (phagadenic, phlegmonous or fetid) is either acute or chronic. Beginning usually at the margins of the gums near the molar teeth or carious tooth, the tendency is for it to become general. Edema, red or bluish discoloration of the gums with a tendency to bleed readily, soreness and pain are characteristic. The lesions become deep, mucopurulent and, if not arrested, end in necrosis and sloughing.

Gangrenous stomatitis (noma or cancrum oris) is characterized by a discolored area upon the inner surface of the cheek which becomes necrotic, malodorous and ulcerated. From within outward there develops an induration and edema. The gangrenous area is surrounded by an inflammatory zone—the zone of demarcation. Fever is high, pulse is rapid and there is more or less prostration. Diarrhoea is common. Toxemia is marked. There is present a yellowish or greenish secretion over the ulcerated area which appears at the angles of the mouth. This condition sometimes follows whooping cough, typhus and cachexia.

Vincent's angina is a fulminating inflammation of the oral cavity due to the symbiosis of the bacillus fusiformis and spirillum Vincenti, characterized by a toxemia and extensive tissue destruction. The soft parts of the mouth and throat become involved and the process may end in gangrene. The pain is severe, deglutition is difficult, and there is fever and the breath is offensive. False membranes are common. The diphtheritic membrane is grayish or fawn color and when stripped off it bleeds and tends to reform. Age incidence is a factor in determining the likelihood, as children up to fifteen are susceptible to diphtheria if not immunized. In follicular tonsilitis the exudate is yellowish and there is intervening, bare tonsillar tissue. Culture displays the specific organisms.

Scurvy is a chronic affection, and although the gums are swollen, spongy, tender and bleed freely, there is a scorbutic diathesis and a history of bleeding from the nose, petechial hemorrhages, sore shins and stiffness of the limbs, sense of fatigue and painful swellings in the calf muscles. The tongue may be clean and moist, but the breath is offensive. Privation and debilitating diseases are predisposing factors. It occurs generally in children or those subject to long periods of exposure.

Pellagra, alleged to be due to the

ingestion of spoiled corn, has been repeatedly demonstrated by Klauder during recent years to occur more commonly than supposed. Klauder after extensive observation attributes it to the inordinate or excessive use of wines, spirits or beer. With pellagra there is a more or less severe stomatitis which tends to chronicity. The appearance of the tongue is referred to as a "cardinal red" tongue. The tongue may be smooth and is then said to be "bald." Salivation, pyrosis and a fetid breath are commonly observed. The characteristic symptoms are a gradually increasing anemia, loss of flesh and strength, psychic depression, and neuromuscular pains. The erythema is usually limited to the hands, arms, face and neck and is bilateral.

In making a diagnosis, occupational exposures must be considered, cooking utensils, and drugs used internally and externally as inunctions or douches. Lead stomatitis is identified by the presence of a bluish or grayish-black discoloration of the gum (lead sulphid precipitated in the tissues by sulphuretted hydrogen of the tartar); lead cachexia; lead encephalopathy (dizziness, vertigo, tinnitus aurium); lead neuritis; palsies and colic of vague origin. A history of the occupation of painter, plumber, structural iron worker, mechanic or pipe fitter is significant. When the iodides are the cause there is a history of treatment, soreness over the parotid gland and perhaps enlargement. Epileptics drugged with bromides are susceptible to ulcerative stomatitis.

Local discomfort of syphilitic or specific lesions is largely a matter of individual appreciation. The affection may be nothing more than a superficial condition in the beginning and become severe and dangerous if unobserved. Irregular erythematous patches of a peculiar red and a slightly roughened membrane are sometimes observed in the beginning. The mucosa throughout may be moist and upon it appear mucous patches of a grayish white irregular form. These patches are distinctive, highly infectious and, when removed, frequently reveal ulcers. General cutaneous manifestations, as a rose-colored rash which later becomes coppery, may be present upon the body. There may be several or a great many skin lesions, multiform, macular, papular, vesicular and pustular. A mucopurulent, greenish or yellowish exudate is frequently observed about the ulcerations. The occipital and epitrochlear glands enlarge. Psoriasis occurs upon the extensor surfaces. The lesions are larger, scaly, dry and bleed when the plaques or scales are removed.

Hypertrophy of the papilla of the tongue is an early manifestation of syphilis, but after the age of fifty the tongue may become indurated and smooth. Frequently there is a history of a sore throat or the voice may be affected. Various complaints, as headaches, loss of appetite, stomach trouble, ease of fatigue, insomnia due to neuromuscular discomfort, are common. The breath has a peculiar and, in fact, a characteristic fetid odor.

Syphilitic stomatitis is a secondary manifestation and indicates very often the case of unsuspected syphilis because of the absence of a genital chancre. Gummas of the mucous membrane and subcutaneous tissues not infrequently

break down and give rise to extensive ulceration.

The initial lesion appears in from two to five weeks following exposure. Rather than the reddish papule, firm, hard and painless, it may occur in the oral cavity as a necrotic area proceeding to ulceration and, if in the vicinity of a carious tooth, may be regarded as an ulcer from the irritation from the tooth. Healing is sluggish and without treatment takes as long as eight weeks or more. Syphilitic lesions of the tongue have been mistaken for cancer and as a consequence excision has resulted.

Glossitis is an inflammation of the parenchyma of the tongue. The mucous membrane investing the tongue is generally involved in a stomatitis. The same causes that are active in stomatitis are active in glossitis with the exception of specific lesions. The tongue may be affected to the extent of marked swelling, fissures, furrows, redness, irregularities and protrusiveness. Mastication, deglutition or contact with the teeth is distressing and painful. Debilitating and infectious diseases, alcoholic beverages, tobacco and extremes of temperature are predisposing factors.

Leukoplakia or smoker's tongue is characterized by dense whitish plaques varying in size, commonly smooth, but which may become papillomatous. These lesions are considered forerunners of cancer. Prevention is the best treatment.

Black tongue is a phenomenon prompting hypertrophy of the filiform papilla and is probably a trophoneurotic disturbance characterized by a secondary deposit of pigment. There are observed thick fur-like patches varying in color from a blackish brown to a bluish yellowish brown. The color is due to the stain of iron oxid upon a subject susceptible to irritation. Blood is decomposed and the iron is deposited upon the keratosed epithelium. It is a chronic disorder brought about by mouth washes containing reducing substances, chemicals and tannic acid. It is confused with stains in the beginning and differs from bronzed diabetes in that in the latter the discoloration is confined to the inner surface of the lips and cheeks. Treatment of black tongue consists of the periodic use of a three to five percent hydrogen peroxid solution followed by a saline wash, and the application of salicylic acid in alcohol or glycerin following the wash. It is never advisable to scrape or use escharotic applications. In any treatment about the mouth where there is blood, however slight, avoid the use of reducing substances or oxidizing agents.

Periodontitis, alveolar dental periostitis, is an inflammation of the investing membrane of the roots of the tooth which also involves the gum and mucous membrane. This membrane supplies the cementum and dentin and is susceptible to inflammation from a slight irritation. Immediate causes are caries and diseases of the gums and any remote condition influencing the tissues of the mouth in general. It might be a focus for infection elsewhere in the body.

There is early discoloration and swelling of the gum. It bleeds, becomes tender and if suppuration intervenes the gum recedes and sloughs. In chronic forms and following severe acute attacks of stomatitis the sequel is

a periodontoclasia. There is usually a fulness in the affected area and a desire to press the teeth together. Pressure may in the beginning afford temporary relief. The tooth feels longer and in many instances actually is raised. A dull, heavy or continuous pain is common as the affection spreads. The tooth is responsive to thermal changes. Mastication becomes painful. The pain of the acute type is pulsating and severe. When the apex becomes involved the pain is referred.

Osteomyelitis, although generally accepted as a surgical condition, has not infrequently responded to medicinal treatment. The causes are various, as in stomatitis. Syphilis and typhoid are examples of the systemic etiological factors. It occurs occasionally incident to caries and acute infections. The treatment is much the same as that for stomatitis with the exception that solutions should be hot and the gum detached to expose the bone affording the full effect of the solutions. Neosalvarsan is indicated where syphilis is present. Streptococcus and staphylococcus sera are said to be beneficial when indicated. Neosalvarsan has also been used when the infection is due to the streptococcus. Neutral acroflavine 0.1% has been used to advantage as a germicide and antiseptic.

Unless undertaken by one endowed with the best clinical and surgical judgment attainable, it would be folly to treat this expectantly. Therefore, if highly satisfactory results are to be obtained, mediocre medicinal treatment is unwise.

Parotitis, or mumps, is due to an acute specific infection and is epidemic. It is said to be acquired through the breath or saliva and thence transmitted through Stensen's duct. Secondary parotitis is observed as a sequel to pelvic operations upon the female and following injuries to the testicles. Medication such as iodin, industrial poisoning such as lead and mercury, syphilis and nephritis produce chronic parotitis. Distention of Stensen's duct is observed in glass blowers and musicians.

When calculi are present in the duct the discomfort is worse at or following meals, due to the distention. Calculi may be years in developing, and the discomfort and pain may be referred to the floor of the mouth. When there is a tendency to closure of the duct a small amount of iodin applied about the orifice of the duct, it is said, will tend to widen it. Injuries or diseases of the mastoid involving the facial nerve will affect the parotid and incidentally the duct.

The submaxillary or submental glands may be involved in any general disease or as a sequel to any affection of the tissues of the mouth. The glands become enlarged and tender. Removal of the cause and counter-irritation alleviate the affection. A dilatation of Wharton's duct or a mucous gland at or near the frenum is a ranula.

Sigmatism is a term used to denote a perversion in the use of the voice, substitution of sounds, faulty pronunciation and the repetition of words or syllables. In the language of the day the word refers to stuttering or stammering. The causes are numerous—anatomic, hereditary, physiologic and pathologic. Although ordinarily not considered in the field of dentistry,

many cases have been benefited by dental attention. The observing dentist can readily verify this statement if he pays more attention to the manner of speech and seeks a cause for any inequality. An intelligent study requires a knowledge of central nervous diseases. The subject is of vast importance and too big to discuss here.

It is obvious from the foregoing discussion that preventive measures or prophylaxis, irrespective of the cause or lesion, affords immeasurable returns. There are few divisions of medicine presenting more opportunities to demonstrate the wisdom of prevention than in the practice of dentistry.

Pregnancy with only a suspicion of specific infection is better managed after a provocative dose of neosalvarsan followed by a Wassermann test. Congenital deficiencies are better arrested in utero, especially syphilis. "Know syphilis in all its manifestations and all things in medicine will be revealed to you." — Osler. The diabetic who exhibits oral pathology should have as part of the treatment a study of blood chemistry with the view of revising the diet chart and perhaps eliminating an acidosis which interferes with dental efforts and predisposes to infection, sloughs and delayed healing.

Occupational diseases or poisons must be understood and eliminated; spurious dentifrices, ill adapted toothbrushes, unhygienic nursing bottles and equipment, the inefficient milk formula, overcrowding and inequalities of food in institutions, etc., must be avoided. Failure to correct functional disturbances, faulty prosthetics, excesses of adrenalin chlorid and many more must cease before preventive measures stand out as glowing examples of progress.

Blood dyscrasias, affections of the endocrin system, and cardiorenal disease undermine in an insidious manner, rendering tissues vulnerable to infection and slow to repair. Nasopharyngeal and accessory sinus diseases command attention. If preventive oral practice is to be successful, much will depend upon the ability to correct any focus of infection, and, what is vastly of more importance, physicians and dentists will have to learn how to recognize not only the frank infections but the incipient or latent ones.

The best diet compatible with the health of the oral cavity is one consisting of a liberal supply of organic bases, calcium and phosphorus, well balanced and free from foods likely to leave an acid ash residue. For active treatment, a diet of liquids or semi-solids of alkalin reaction, correct in temperature and free from condiments, is indicated together with abundance of water to which liberal amounts of sodium bicarbonate, sodium or potassium citrate have been added.

Kidney elimination must be encouraged. Sixty to eighty ounces in twenty-four hours is encouraging. The bowels should be kept in a healthy condition.

Any of the lesions specified might be discussed ad infinitum. I have endeavored to impress the fact that oral medicine is a comprehensive subject and equally as important as the surgical aspect. If it is not as captivating as the latter it is certainly more conservative. Visibility of lesions is a reality which commands more respect from the viewpoint of treatment and until convictions prevail concerning

prevention there will always be ghosts of yesterday. "To have erred is human," but to have lost the profits of omissions is tragic, if not in dollars then in graves.

Atlantic Hospital

[PERIODONTOCLASIA CAN BE PREVENTED]

Should periodontoclasia develop in a dental patient's mouth? We say that it should not. Then how can the development be prevented? In those who have normal or near health, prevention is accomplished by preventing the accumulation of bacterial masses about the necks of the teeth. —PILCHER.

A Modern Treatise on Periodontoclasia

By M. A. MUNBLATT, D.D.S., Brooklyn, N. Y.

It seems almost superfluous to attempt a discourse on periodontoclasia. There are books a-plenty, and dental publications in almost every issue can boast of abundant literature on the question, nevertheless periodontoclasia is still a subject of dispute and lacks a proper scientific presentation.

The desire of the dentist to consider himself and train himself as part of the medical profession is uppermost in the mind of every practitioner, and periodontoclasia is a means whereby considerable headway in that direction can be attained. Pyorrhea is, as we all know, the popular name for this disease, but we must not forget that pyorrhea implies a flow of pus and therefore limits the disease to that condition. To be more correct, however, we must realize why the term *periodontoclasia* or *periodontal disease* is gaining more favor with the profession.

In the study of any disease, in order to systematize and place it on a scientific basis, it is necessary to divide the subject into six parts, namely: (1) etiology, (2) diagnosis, (3) prognosis, (4) treatment or modus operandi, (5) prevention, (6) hygiene or care.

Etiology

In discussing the etiology of periodontoclasia it becomes necessary first to have a proper understanding of what we mean by pyorrhea. There are some individuals today who maintain that the only cause of pyorrhea is the irritation created by the salivary calculus that forms in the gingival crevice. Orban states that, since pyorrhea implies a flow of pus, that flow can come only from the gingival crevice, and that salivary calculus is the only irritation that will cause enough destruction of the soft tissues and the bone to create this flow of pus. On the other hand, Stillman, McCall and many others state that traumatic occlusion is the all-important factor, and, although they maintain the necessity for the removal of salivary calculus, their contention is that no cure will be obtained without a correction of traumatic occlusion. For this reason Stillman further maintains that traumatic occlusion in some form is, in a great majority if not in all cases, the etiologic factor, and that salivary calculus is only a contributing cause. Let us analyze both of these contentions.

The author can readily realize that both schools are not so far apart as they try to make us believe. We might say that both factions are correct in their belief, but that they start out with a wrong conception of the disease. It goes without saying that if pyorrhea signifies a flow of pus, that flow can come only from the irritation of a foreign body that creates an inflammation in its various stages. On the other hand, if we realize that there are many pathologic conditions of the gingiva and the supporting bony structure that are not yet in the stage of pus formation, we must appreciate that the viewpoint of either school is considerably narrow. Periodontoclasia is no doubt the appropriate name for the many

pathologic conditions of the tissues surrounding and supporting the teeth, and we shall now endeavor to describe and define what we mean by periodontoclasia.

The greatest fault to be found with the dental profession is the fact that, although it realizes its important connection with medicine, it lacks the broad scientific viewpoint of medical science. Everything we do, every restoration we make, every operation we perform and every treatment we follow, is based on the most fallacious foundation of mechanical principles. We can readily see why this condition exists if we take into consideration the fact that the dental apparatus in its functions is nothing more than a mechanical arrangement for the proper mastication of food, and that nature has arranged that apparatus to a perfection not equalled in many instances by the efforts of man. The temporomandibular joint, the condyloid process of the mandible, the muscles of mastication with their appropriate attachments, the shape and the arrangement of the jaws, the shape and the arrangement of the teeth, the cusp formations, the variations from anterior to posterior teeth, and, finally, the histological structures with the mechanical principles in the form of shock-absorbers and interlocking fibers of various directions for the purpose of proper retention of the teeth, all go to form the completed product of the dental apparatus with its forces of occlusion and interrelationship of one arch to the other. Is it any wonder, then, that we have made mechanical factors our basic principles?

However, we have overlooked the all-important fact that we are dealing with biological processes, which are the basic principles for the most complicated machine with its bio-mechanical, bio-chemical, bio-physical and other factors, in the form of our general nervous and physiological system. Pyorrhea is no exception to this condition, and when we prefer to use the term *periodontoclasia,* we must realize the proper ramifications of the pathologic conditions of the supporting structures of the teeth, and we must not forget that histology and microscopic pathology are of prime importance in diagnosis, etiology and treatment of any disease.

With this broader viewpoint, then, it becomes necessary for us to analyze the causes of periodontoclasia which embody various conditions of pathology. We may have a loosening of the teeth with or without pus formation; we may have an active purulent discharge with or without a loosening of the teeth. We may have an inflammatory condition of the gingiva that may or may not be an early stage of the disease or may or may not be interrelated. We may have an extensive alveolar destruction with the presence of granuloma and the other previous conditions combined, while at another time we may have a slight alveolar destruction, a loosening of the teeth without an apparent inflammatory condition of the gingiva. All these conditions might be classed as pathologic, yet we must realize in the study of histology that except in real extremes the demarcation line between physiology and pathology is very often not distinct and precludes and necessitates careful study before a proper diagnosis can be made.

On the question of periodontoclasia we must not forget that we are not dealing with fixed conditions. Histology teaches us that the teeth and the surrounding structures undergo a continual development and growth from the day we are born until the day we die, and this development and growth come as a result of stimulations which may be bio-chemical or mechanical, according to the individual case. We have been told by Gottlieb and Orban that the tooth continually grows in its socket, and that it has a physiologic movement toward the median line. According to these investigators the cementum, the periodontal membrane, the alveolar and the epithelial structures all respond and develop with this movement and growth. When the stimulations become irritations, according to our histologists, we then deviate from the normal and have developed a pathologic condition. The name *periodontoclasia* no doubt admirably covers the various pathological conditions that may be produced as a result of the various kinds of irritation. In other words, we may have an inflammatory condition of the gum that may or may not develop into a true pyorrhea or may not even be interrelated. We may have a loosening of a tooth with atrophy and destruction of the alveolar structures with or without an inflammatory condition of the gum and with or without pus formation. All these conditions may be an early stage of true pyorrhea or may not have any connection with true pyorrheea, nevertheless they are pathological conditions that can well be classed under the name of periodontoclasia. If we, then, define periodontoclasia as any pathologic condition of the supporting structures of the tooth not caused by a specific microorganism and including the periodontal membrane, the gingiva and the alveolus, as well as the cancellous bone beneath the alveolus, we can readily see that we can come to a more concordant opinion in the discussion of etiology and diagnosis.

Stillman and McCall emphasize the importance of traumatic occlusion as an etiologic factor, and in their method of treatment they make the correction of traumatic occlusion their primary procedure. Of course they give prophylaxis worthy consideration, the removal of salivary calculus is carefully performed, and in their treatment of this disease, which they properly call periodontoclasia, they have endeavored to classify carefully the various conditions and stages of pathology with which we are confronted. Great strides have been made in the treatment of this disease as a result of their work. They have enabled us and encouraged us to make careful studies of each case with the aid of the roentgenogram and the various clinical manifestations, and in this way we are able to outline a proper procedure of instrument manipulation in the removal of calcareous deposits, granulomata and destroyed tissues to be found within the gingival crevice and the more advanced condition of pyorrhetic pockets. Their method of treatment is based on a conservative plan of approach in the removal of local destruction and correction of local irritations that may cause the pathologic conditions which they find.

This school of individuals first attempts to remove the local irritation which may exist by the correction of

traumatic occlusion, proceeds with a careful instrument manipulation for the removal of the destroyed tissue and salivary calculus, and then attempts to build up a healthy tone in the gingiva by the proper use of the toothbrush, with the purpose of blanching the tissues and stimulating a flow of new blood into the area and in this way taking advantage of the natural forces of elimination and cell activity in the form of tissue repair. Their results are no doubt very encouraging, and they bring about remarkable cures whenever the disease is not too far advanced in the form of excessive destruction of the alveolar support. They base their reasoning on the premise that periodontoclasia and true pyorrhea are nothing but local diseases caused by local irritations, with emphasis on traumatic occlusion, and, although they consider the resistance of the patient as an important factor, they can find no constitutional cause for the disease.

Gottlieb and Orban agree with Stillman and McCall that pyorrhea is a local disease caused by local irritations, but they maintain that since pyorrhea implies a flow of pus its only cause is the salivary calculus that forms an irritation in the gingival crevice. Traumatic occlusion, they contend, does not cause pyorrhea, but they do show an alveolar atrophy that may be caused by traumatic occlusion. They maintain that in some cases this condition has nothing to do with pyorrhea, and they cannot account for any reason why the unfavorable reaction, in the form of this atrophy, should result in some instances more than in others.

If we realize that Orban and Gottlieb consider as pyorrhea that condition only wherein there is a flow of pus from the gingiva, we may concede that salivary calculus is the only irritation that may cause true pyorrhea. However, we cannot neglect the various pathologic conditions of the supporting structures in a discussion of this disease, and, when we include in the definition of periodontoclasia all the various stages of pathology that we may find, we can readily realize that we must include all other kinds of irritation, such as trauma, faulty occlusion, faulty fillings, etc., in the study of its etiology. The stage of true pyorrhea, then, we can realize, may develop as a result of any local irritation, and the clinical experience of many practitioners will substantiate this. However, we must not overlook the fact that we are contending with an inflammatory condition, and, although local irritations may appear as the primary factor in the disease of periodontoclasia, systemic resistance, biological processes, cell activity and bacteriology must receive proper attention in the study of any disease. We therefore cannot isolate periodontal disease from the rest of the body and give it only a local consideration.

In the study of pathology we find that the etiology of any disease is divided into (1) predisposing or indirect causes and (2) specific, direct or exciting causes. Predisposing causes include all conditions, influences and agents that increase the individual's susceptibility to the disease, while the specific causes are the direct and final factors which result in the outbreak of the disease and also determine its nature. There is sometimes no definite dividing line between predisposing

causes and exciting or direct causes. The former may become the latter, depending on individual conditions. However, the study of pathology tells us that the two classes are mainly distinct, and that in the majority of instances the body as a whole or the part or parts subsequently affected are first acted upon by the predisposing causes, preparing the tissues for the successful invasion or development of the real specific causative factors.

Let us apply the facts cited to the disease or pathologic conditions classed under the name of periodontoclasia. First of all, we can realize that local irritations play a prominent part in the etiology, and they may be any of the conditions we have mentioned, namely, salivary calculus, traumatic occlusion, irregularities of the teeth, faulty fillings, etc. We might call these conditions the direct or specific causes, but, on the other hand, irritation may be either a contributing cause or the specific or direct cause. In other words, traumatic occlusion may be a contributing cause and salivary calculus the direct cause of irritation in one instance and vice versa in another instance. However, we cannot deny the fact that all these local irritations could best be classified under the heading of direct or specific causes of periodontoclasia.

As has been previously stated, we are not to consider periodontoclasia as a disease distinct from the rest of the body and different from any other inflammatory condition regardless of where it exists. Therefore in the study of the etiology of this disease we must consider the predisposing or contributing causes that may exist in the form of constitutional factors. The author's clinical experience has shown beyond a doubt that constitutional factors play a prominent part and may even in certain instances appear to be the direct or specific cause of the periodontoclasia with the local irritations as the contributing factors. In other words, the author has found many cases of true pyorrhea that showed very little signs of traumatic occlusion as well as slight irritations from salivary calculus that did not respond to local treatment regardless of the care in its manipulation. While further experimentation makes him inclined to believe that local factors are primary in the majority of instances, we cannot neglect certain systemic complications, such as faulty metabolism, endocrinology, pregnancy, lowered resistance and other constitutional diseases, that tend to form the contributing causes, and that in some instances, we might say, are the direct etiologic factor in any pathologic condition of the dental apparatus or the oral cavity which may result in some form of periodontoclasia.

We must appreciate the fact that physiologic processes and growth continue incessantly in the supporting structures of the dental apparatus, and that any systemic complications that might cause a stimulating factor to become an irritation will no doubt bring about any form of periodontoclasia. The irritation may develop directly in the form of salivary calculus, irregularities of the teeth, food debris or even abnormal cell activity within the tissues themselves. We see, then, that each case of periodontoclasia is to be studied individually, and that what may be the direct cause in the form of any of the irritations mentioned in one instance

may be such only because of constitutional contributing or indirect causes in the form of any lowered resistance in another instance. We might also find some systemic disease or disturbance as the direct cause with or without local irritations.

We further must realize that we are dealing with bacteriological processes also, and that sometimes a slight inflammatory condition will result and progress as a severe case of periodontoclasia for no other reason than that the bacteriological development and growth within the tissues offer no local nor general resistance toward elimination of that bacteriological process. With this understanding, then, of the variations in etiology let us now proceed with a brief discussion on the diagnosis of the disease of periodontoclasia.

DIAGNOSIS—PROGNOSIS

The modern tendency in the description of periodontoclasia is to classify the various stages of pathology we may find. The processes of pathology might be divided into four stages: (1) early inflammatory reaction following the initial invasion of bacteria as a result of irritation, (2) loss of some of the epithelial lining at the extremity of the gingival crevice and the establishment of ulceration in the cemental gingiva, (3) progressive loss of tissue and the formation of a pocket in the cemental gingiva, and (4) establishment of a pocket in the pericementum. The final result is the formation of a typical pus pocket with a severing of the pericemental fiber, and the name we may give to that condition is *pericementoclasia.*

It is therefore important to employ the radiogram in making a diagnosis of dental and oral pathology. Recognition of early stages of periodontoclasia in any area of the dental apparatus is necessary and offers a favorable prognosis. The amount of alveolar structure that is destroyed should be noted, and, where we have a case of true pyorrhea, prognosis depends on the amount of healthy supporting bone that has not yet been destroyed in the inflammatory process. We could mention numerous combinations of periodontoclasia and stomatitis that may exist in the individual case. They are all to be studied carefully and classified, in order to be a guide in the amount of instrumentation. On the question of prognosis it is safe to say that, where less than one-third of the root is covered by alveolar support and the teeth are very loose, the case is hopeless and extraction of the teeth is the most advisable procedure.

TREATMENT

The treatment of periodontoclasia is subject to the same dissension of opinion as the study of its etiology. All agree on the necessity of prophylaxis and the removal of salivary calculus wherever it exists. They further realize that a careful removal of granulomata and destroyed tissue is necessary. While some emphasize the correction of traumatic occlusion, others maintain that condition to be of secondary consideration and only to be corrected when excessive. The author finds that the operative procedures are individual problems, and in the treatment of any stage of periodontoclasia he considers all types of irritation as causative factors and endeavors to correct them whenever possible. When he finds

excessive traumatic occlusion in certain instances, he corrects it very conservatively, and he often finds in his experimentation that there are certain areas that tend to show the existence of traumatic occlusion, with the result of a true pyorrhea that responds to treatment without the correction of traumatic occlusion.

Occlusion is of considerable importance in the study of any type of dental and oral pathology, and, although there are many conditions where faulty occlusion with subsequent trauma is the direct cause for the existing pathology, we can find also many irregularities of the teeth and malocclusions that show no pathology of the supporting structures whatsoever.

The author of course realizes that the length of the roots, the size of the crown, the thickness of the periodontal membrane and other anatomical arrangements are to be considered. Nevertheless he can emphatically say that no one condition is the direct cause in all cases of periodontoclasia and true pyorrhea. At the same time he realizes the constitutional factors that play a prominent part in this pathology as well as in other diseases of the anatomy, and in his treatment very often he finds it necessary to refer the patient to a physician. His results in those cases are successful only when cooperation from the physician and the patient is obtained. There is no doubt, however, that further study and clinical experimentation on periodontoclasia from a medical and dental viewpoint are urgent. In this way we shall be able to detect the proper connection between systemic diseases and the manifestations of periodontoclasia which no doubt exists.

There is also a good deal of dissension on the question of the proper operating technic in the treatment of periodontoclasia. There are some who believe that ordinary instrumentation, carefully performed, is all that is necessary and warranted in any condition of this disease. There is a school of individuals, however, who practice the plastic operation of surgical periodontia. There are others who maintain that this latter operation is unnecessary. But the author finds that the choice of technic depends on the individual operator and the conditions. In his own practice he has often come across cases of true pyorrhea in the area of an individual tooth or of a number of teeth that does not respond to conservative instrumentation in the hands of many operators. He finds in these cases that a careful flap operation is indicated and secures gratifying results when this is done. He further finds that another indication for this operation is when a patient is referred by the physician as a result of some systemic disease such as rheumatism, etc., and shows an advanced stage of periodontoclasia. In that case the indication for the plastic operation is manifested for two reasons: (1) the systemic factor involved necessitates a clear view of the infected area and a complete removal of granulomata and destroyed tissue, which can be better performed by the flap operation; (2) the necessity for immediate results that can best be accomplished in this manner. We must emphasize, however, that proper cooperation between physician and dentist is very important in such cases.

The author prefers to use a conservative method of instrumentation in

ordinary cases, but when the need arises, as he sees fit, he considers the flap operation a valuable addition to his technic. The operation, of course, must be carefully and aseptically performed without laceration of tissues and undue trauma. Postoperative treatment must be instituted and a careful hygiene should be arranged.

Regardless of the technic employed or treatment administered, the cooperation of the patient is absolutely necessary in order to maintain a healthy condition of the tissues and thereby prevent recurrence of the disease. The author therefore wishes to mention the various methods of gum massage with the aid of the toothbrush. He finds the toothbrush of importance in the treatment of periodontoclasia, and the methods suggested by McCall, Stillman and others have the tendency to build up a healthy tone of the tissues and thereby help to eliminate the infection and pathology present. The patients should be taught the proper use of the brush, and we must emphasize the necessity of their cooperation.

It is advisable at present to mention the toothbrush. The consensus of opinion is that the size of the brush should be small and the bristles long. There is a group of individuals who make objections to the use of a toothbrush and give various reasons for their contentions. There is no doubt that the improper use of the toothbrush is very harmful and may cause abrasions of the teeth and lacerations of the gums, but this condition may be corrected by teaching the patient its proper use. The main reason for the objection is to be found in the fact that the brush is difficult to keep clean and is therefore unsanitary. To some extent this may be eliminated, as many have suggested, by freely pouring salt on the brush after its use and allowing it to dry until the next time. The author finds that the proper use of the toothbrush is the most important factor for the maintenance of dental and oral health, and we must leave bacterial invasion for the general resistance of the individual to overcome.

PREVENTION—HYGIENE

Prevention of periodontoclasia should no doubt be the aim of the dental profession, yet we must realize that a good deal depends on the individual himself. Dental and oral hygiene is absolutely necessary. Although nature endeavors to give us ideal anatomical structures and physiological processes, she also intends to have us cooperate by exercising proper rules of hygiene. The lower classes of animal life manifest general hygiene instinctively; it is most interesting to watch the cat in his careful manoeuvres for cleanliness. Nature has provided the animals with rain, pools and other forms of water for the purpose of cleanliness as well as for drinking, and the animals use these facilities instinctively. Dental hygiene in some form also must be exercised by animals.

Proper use of the teeth and the chewing of food helps the animals considerably, and a carefully selected diet is better observed on their part than by man. Modern civilization has changed the diet of man to suit his pleasures. Nevertheless, in spite of the better dietary of our ancestors, they also no doubt suffered from periodontal disease to a lesser or greater degree.

Unquestionably animals also suffer from dental and oral disease, regardless of correct diet and proper living, but this is due to the biological complications of nature with its pathological processes. Personal hygiene in all its ramifications is necessary, and the proper use of the toothbrush, a well-balanced diet, conservative living, sufficient rest, plenty of exercise and fresh air are all important factors toward the maintenance of dental and oral health, as well as of general health. While there may be many who overlook proper hygiene without apparent unfavorable reactions, we may find on closer examination early stages of pathology that might develop more seriously if neglected.

Periodontoclasia can be prevented, but we must not forget that, in addition to local irritations in the form of salivary calculus, trauma, faulty fillings, improper bridgework and other conditions, we are involved in biological processes. Our teeth and the supporting structures are not fixed conditions, and any faulty metabolism or lowered resistance is liable to cause a physiological stimulation to become an irritation with resultant unfavorable reactions. It is the duty of the dentist to recognize this early pathology and also the obligation of the dental profession to educate the public to the importance of proper hygiene and early attention to defects and abnormalities. Any dental restoration, regardless of the type and perfection at the time of insertion, should be examined frequently for any changes that may develop both in the restoration and in the dental apparatus and oral tissues with which it comes in contact.

The treatment and prevention of periodontoclasia should form a phase of dental practice employed by every conscientious dentist. It is a disease that requires no special kind of skill nor excessive study and training that cannot be mastered by every modern practitioner. It calls only for care, a willingness to study the latest theoretical developments, and a desire to give honest and patient professional service to patients. Any technic employed in its treatment can easily be mastered by the ordinary individual if he applies himself and fortifies himself with a diligent study of dental science. There is no question, however, that there are many problems in periodontoclasia that are yet to be solved which exist not so much in technic as in the systemic relationship of the disease, and which will be discovered only when proper cooperation is developed between the dental and the medical professions.

The latest developments from the Mayo Clinic, of Rochester, Minnesota, prove conclusively from a clinical and laboratory viewpoint that pyorrhea is a causative factor of many systemic diseases.* In their experiments the streptococci obtained from the pyorrhetic pockets of individuals suffering from a number of systemic diseases are cultured in some proper medium. A number of rabbits are injected with the streptococci obtained, and it is found that pathologic lesions resembling those possessed by the individuals from whom the bacteria were obtained are present in the animals examined.

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* Cook, Thomas J., and Stafne, Edward C., *Bacteriologic Study of Pyorrhea Alveolaris,* The Dental Cosmos, February, 1929.

CONCLUSIONS

(1) The causes of periodontoclasia and true pyorrhea are not the same.

(2) The direct or specific causes of periodontoclasia are found to be some kind of local irritation. The contributing or indirect causes may be any lowered resistance or systemic disturbance.

(3) In some instances true pyorrhea may be caused directly by constitutional factors, and the local irritations in that case are only contributory.

(4) It is of vital importance to recognize the early stages of periodontoclasia.

(5) Periodontoclasia is a disease that should be mastered by every dentist, and its treatment should form a part of his practice.

(6) Further discoveries in the study of periodontoclasia will come as a result of proper cooperation between the physician and the dentist.

62 Hanson Place

[M. D. NOT NECESSARY FOR DENTISTS]

It may be going too far to say that all dentists should be doctors of medicine, but certainly all dentists should know much about the practice of medicine as a whole, and conversely all physicians should know more about dentistry, its importance and possibilities. —MAYO.

Forty-seven Reasons Given by Patients for Changing Their Dentists, With Comments by the Author

By RUSSELL W. FORCE, D.D.S., Pasadena, Cal.

1. No attempt made by the dentist to explain the work necessary, therefore no cooperation with the patient either as to time required or as to fee.

Comment.—The dentist must remember that the patient also is spending time and money and is entitled to a complete explanation both by models and by x-rays of the work necessary.

2. Using an instrument in the mouth or placing it on the operating table without sterilization after dropping it on the floor.

Comment.—Although we often hear, "The floor was clean enough to eat from," seldom would a patient appreciate it if practically compelled to do so.

3. Wiping instruments on the towel covering the patient.

Comment. — No fastidious patient cares to have blood, saliva or salivary deposits in such close contact with his person. Use the dental napkins.

4. Allowing medicine to get on the hands or cotton rolls and thus burning the lips, cheeks or tongue.

Comment.—The usual dental appointment is not such a joy that the patient wishes to be constantly reminded of the visit for a day or so with gums or lips sloughing from a phenol burn.

5. Allowing instruments to slip, cutting the gum.

Comment.—The patient is apt to think that carelessness in instrumentation will mean carelessness in all the work to be done.

6. Allowing cotton pliers to pinch the lips.

Comment.—If you cannot see the lips, how are you going to see the cavity to be filled?

7. Too hard pressure used on handpiece.

Comment.—Remember that you are operating on living tissue, not doing carpenter work.

8. Cutting with a bur for too long at a time and not allowing a breathing spell in between.

Comment.—The patient likes to come up for air once in a while, and this incidentally avoids overheating both the bur and the tooth.

9. Taking dentures directly out of the mouth with the hand instead of using a gauze napkin.

Comment.—It is not very pleasant for the patient to have a denture removed with strings of saliva adhering. Also, such a practice makes the patient wonder if the operator has ever washed his hands.

10. Working with the head too close to the patient.

Comment.—Most patients do not care for personal contact with those outside their own family; besides, you might have dandruff.

11. Resting arm on patient's shoulder when operating.

Comment.—If your arm is so unsteady that you need such a rest, you'd better go to bed earlier.

12. Whistling under breath when operating.

Comment.—The patient thinks the dentist's mind is not on his work.

13. Clumsy handling of instruments.

Comment. — The patient likes to think of his dentist as a clever operator —not as a blacksmith.

14. Mixing amalgam in the palm of the hand.

Comment.—The patient has no desire to have perspiration and possibly dirt from the palm of the hand incorporated in the filling.

15. Not keeping appointments.

Comment.—Remember that the patient is likely to have other appointments as well as you.

16. General "knocking" of work completed by other operators.

Comment.—Why try to destroy trust in another dentist? Besides, he may have worked under conditions about which you know nothing. Also, *your* work may be worse.

17. Work done in too much of a hurry.

Comment.—Every patient demands and should have the necessary time to have his work done to the best of your ability.

18. Taking unnecessary time to complete the work.

Comment.—This shows either unfamiliarity with the work or laziness.

19. Not enough care given to individual cases.

Comment.—Each patient likes to think that the dentist is paying particular attention to his special case, and that his operator has not the mental attitude of the barber who calls, "Next."

20. Bills not sent out on the first of the month.

Comment.—If you do not value your service, no one else will. Patients want all their obligations on hand near the first of the month, otherwise they do not know how much to spend on their bootlegger.

21. Fee too small.

Comment.—If the fee is too modest, the patient feels that you have slighted the work or used inferior materials.

22. Fee too large.

Comment.—If the fee is excessive, the patient feels that advantage has been taken of him.

23. Work explained to the patient as to a child.

Comment.—Few patients would understand technical phrases, but give them the compliment of having as much intelligence as you possess.

24. Incomplete records of previous work kept.

Comment.—It is always best to be in a position to explain when and why you did a certain piece of work.

25. Operator considered himself better than any specialist in the various branches.

Comment.—It is not likely that the average dentist can perform all the diversified operations required in the oral cavity better than men especially trained.

26. Operator allowed his advice to overlap in the physician's field.

Comment.—The patient wanted a dentist—not a physician—and, besides, it is best not to go too far afield from your own specialty. You might give incorrect advice, not knowing all the conditions present.

27. Allowing a patient to develop pyorrhea, without warning.

Comment.—There is no excuse for allowing such a calamity to happen. If you are not sure, send the patient to a specialist and get his advice. Your patient will thank you many times.

28. Sloppy work.

Comment.—If you are too lazy to be careful—take a vacation. If you don't know how—take a postgraduate course.

29. Patient saw dentist smoking a pipe on the street.

Comment.—Many people object to a pipe, so why antagonize them? Keep that pleasure for your home or club.

30. No consideration for the patient's mental attitude at time of appointment.

Comment.—All of us are more nervous at times, so try to study your patient a few seconds at each appointment and respect his mood as far as possible.

31. No consideration of the patient's physical condition at time of appointment.

Comment.—Many times it is best to do very little work at an appointment. Such a procedure would be greatly appreciated.

32. Operator too abrupt in calling attention to condition of the mouth.

Comment.—First find out the reason for the neglect before you censure your patient too harshly. Sometimes it is not carelessness.

33. Operator had alcoholic breath.

Comment.—A hand cannot be steady if backed up with alcohol. Your patient may not know that you had only one small drink.

34. Operator had tobacco breath.

Comment.—It is generally an accepted fact that a second-hand smoke is not especially pleasant.

35. Smell of cigarettes on fingers.

Comment.—There are still some patients who do not care for cigarettes, and they may wonder when you last washed your hands.

36. General untidy appearance of the operator.

Comment.—An immaculate person need make no apologies, but inspires confidence.

37. General untidy appearance of the office.

Comment.—If your office is untidy or dirty, your instruments might be expected to be in the same condition.

38. Untidy appearance of the dental assistant.

Comment. — Your office assistant must be in keeping with the whole office. Generally a new patient sees her first and so gets a lasting impression of you and your office.

39. Hands and nails not kept correctly.

Comment.—If your hands and nails look like a carpenter's, that is the kind of work your patient will expect. Remember, your fingers will be in the patient's mouth. If you forget that fact, they won't!

40. Abrupt manner on part of the operator toward his assistant.

Comment.—Your assistant is another right hand, so treat her as such. Courtesy to her will reflect greatly to your credit.

41. Voice pitched too high or too loud.

Comment.—A low, quiet voice will make your patient relax and will be very likely to impress him with the

fact that you are not at all nervous or overtired.

42. Too much talking on the operator's part.

Comment.—An excess of talk merely makes the appointment longer than necessary, with no benefit to either patient or operator.

43. Too much talking about the personal affairs of the operator.

Comment.—Your personal affairs possibly might not be of any real interest to your patient.

44. Incorrect English used by operator.

Comment.—Using incorrect English would imply a lack of education and study, two qualifications demanded in dentists.

45. Soiled personal linen.

Comment.—Such carelessness would lead your patient to expect the same neglect throughout your work.

46. Body odors noticed on operator.

Comment.—There is no more excuse for carelessness in personal hygiene than there would be in not sterilizing your instruments.

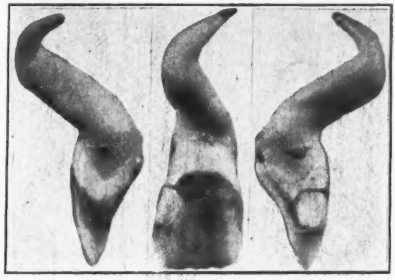
47. Bad breath of operator.

Comment.—Better brush your own teeth, and if that doesn't work—see your physician!

601 First Trust Building.

An Anomaly

The accompanying photographs were taken of a tooth that was sent to us by Dr. Richard R. Gray, of Snoqualmie, Washington. We have never seen a central so markedly abnormal, and the interesting fact is that a radiogram would give no intimation of the extreme curvature of the root.



Traveling Dentists In Queensland

Attending to School Children

By THOS. J. McMAHON, Brisbane, Queensland, Australia

The present Labor or, as it is better known, Socialistic Government of Queensland, one of the Eastern States of the Commonwealth of Australia, has legislated many measures "humanitarian," as they are termed, for the health and comfort of the people of the State. In only a few cases have these been successful; some have been more Utopian than practical, others too costly to continue, and all a distinct burden on the taxpayer.

One that commends itself to the people and may be classed as quite successful is the appointment of dentists, *traveling dentists,* as they are called, to visit State schools and inspect and attend to the teeth of the children. The Government pays all expenses in connection with this very worthy work, no charges of any kind are made, and, while it is compulsory for children to submit to inspection, parents have the right to decline the attentions of the dentists, but must see that their children's teeth are kept in good order. The right to decline is very rarely exercised; rather, the children are

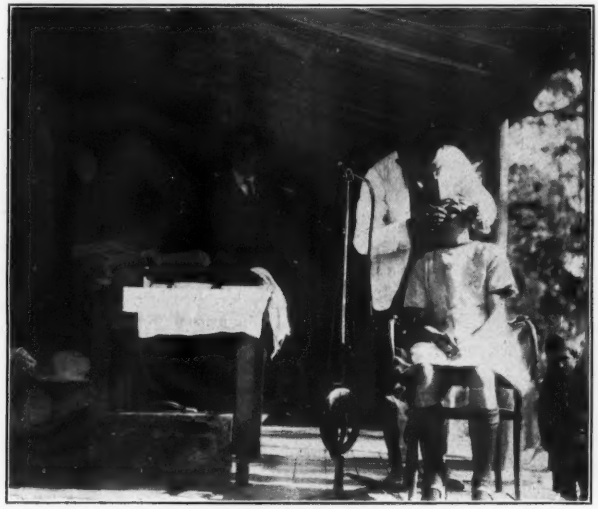
One of the school dentists of Queensland.

encouraged to accept the attentions of the dentists.

Equipped with every appliance of modern dentistry, like school inspectors, the dentists make regular visits to the schools, noting and minutely recording all details of the state of the children's teeth. The little folk are taught to regard the dentist as the foe to toothache, and that sound teeth are necessary to sound health. Official reports show that the health of children throughout the State has been much improved by the work.

On the arrival of a dentist at a school to be attended to at once for extractions or stoppings are told to stand aside. In a few minutes a remarkable amount of gear necessary to the dental work is taken from a wonderfully small case and quickly set up and then work goes on in a very expeditious manner. Sometimes this is done in a classroom, but generally out on the school veranda or in some cool, open place, as is always possible in the sunny clime of Queensland.

Nothing is hidden or kept secret; no fuss is made nor anything done that is likely to create the least fear in even



The school dentist at work.

the children are lined up and, as their names are called, come forward to be inspected. The record-book on a table near by is consulted, and if a child has been inspected before, the dentist sees at a glance the history of the children's teeth and knows what work to undertake without loss of time. Those the most sensitive children. They are treated with great kindness and consideration; the dentist chats cheerily with them during operations about their pets, their games, their homes, and many a little patient is thus distracted from possible thoughts of pain and wondering when the tooth—the "nasty,

aching tooth"—is to come out, when, lo and behold, like the wonderful magician he is, the clever operator holds up the offending tooth to the infinite surprise and pleasure of the patient!

After operations there is a rush to the nearest tank, and here in a buzz of conversation can be heard remarks and opinions as to the dentist and his work as the little patients wash out their mouths, with great pride displaying their open mouths and the places of the missing teeth for all to see. A few minutes later the children are shouting and running about as if no such person as a dentist had ever existed.

Occasionally a "conscientious objector" will arise, some big lad or girl, repeating the parental insinuation that a traveling dentist is "not much chop," as one boy was heard to declare, and refuse to be attended to. These objectors, as a rule, have a bad time, for the children tease them unmercifully; the old opprobrium, "Cowardy, cowardy custard!" is still in force, and many a would-be objector prefers to have his or her teeth out rather than experience the contempt of their mates.

The success of the traveling dentist, also termed the *Government dentist,* has encouraged the Department of Education, which controls the dental corps of the Civil Service, to provide dentists in thickly populated districts with what are called *motor dental caravans,* a complete surgery on wheels. Government dentists are bound by regulations not to compete with other dentists, and that this has been strictly obeyed is evidenced by the fact that there has been no complaint about the matter. When the dental corps was first established some five years ago, the number of dentists appointed was three. Today there is one for every district of the State, and in all fifteen to eighteen.

The Government responsible for this measure is purely Labor or, as it is called, Socialistic and has brought the State into bankruptcy. At the moment anti-Labor forces are combined to throw out the Government in the elections of next May, but a guarantee has been given that if these are successful, the traveling dentists will be retained. And the people are as one in demanding not only their retention but their most liberal treatment.

Resolutions Adopted by the Oral Hygiene Committee of Greater New York

JUNE 27, 1929

Whereas, The Oral Hygiene Committee of Greater New York, the official representative of the entire organized dental profession of Greater New York, has long recognized with concern that:

1. Not only is dental disease the most prevalent of all the diseases to which our children are subject, but outnumbers all others combined.
2. Dental caries is an incurable disease.
3. The only hope for humanity of escape from the sufferings resultant from widespread incurable dental disease is to be found in a program of prevention applied in early childhood and maintained through life; and

Whereas, The Murry and Leonie Guggenheim Foundation, lately created through the enlightened generosity of Mr. and Mrs. Murry Guggenheim, will, by its program of early care and prevention, add immeasurably to the health and happiness of many millions and countless generations yet unborn; therefore be it

Resolved, That the Oral Hygiene Committee, on behalf of the organized dental profession of the City of New York, extends to Mr. and Mrs. Murry Guggenheim its appreciation of their interest in the childhood of this city and its gratitude for the munificent form in which that interest has been expressed; and be it further

Resolved, That the Oral Hygiene Committee of Greater New York takes great pleasure in offering to the Murry and Leonie Guggenheim Foundation the whole-hearted cooperation of the organized dental profession of the City of New York in most effectively serving the children of our city in connection with the purposes of the Guggenheim Foundation.

WILLIAM MCGILL BURNS,
Chairman.

JOSEPH H. KAUFFMANN,
Secretary.

In addition to the members of the Oral Hygiene Committee, there were present Martin Dewey, President of the First District Dental Society, and Samuel Eisner, President of the Allied Dental Council of New York. Charles McNeely, President of the Second District Dental Society, who was unable to attend, has also approved these resolutions.

American Dental Association Meeting

WASHINGTON, D. C.

OCTOBER 7-11, 1929

With Congress in session, the President at home in the White House, the racing season at Laurel (Washington's own race course) in full swing, members of the American Dental Association attending the Seventy-first Annual Session in October will have ample opportunity to occupy themselves when not engaged in the business of the convention.

The program arranged by the Local Committee will provide perhaps the most extensive entertainment schedule ever undertaken at a meeting of the American Dental Association. Numerous trips to near-by interesting places, such as Mount Vernon, Alexandria, Great Falls on the Potomac, Arlington and other points have been arranged. There are so many interesting things in Washington and its environs that the delegates to the American Dental Association will find it impossible to cover everything and at the same time indulge in recreation. Of course there will be many golfers among the visitors, and for their diversion there are not less than fourteen golf courses in and about Washington.

When Washington was selected for the annual meeting this year, it was not thought that Congress would be in session, because ordinarily that body does not convene until December, but

the extraordinary session called by President Hoover to consider farm relief and the tariff will make it possible for visitors in October to see one of the most interesting features of Washington life.

Both houses of Congress will be engaged in the consideration of matters that doubtless will prove exceedingly interesting to the visitor. The United States Supreme Court also will reassemble for the fall term in October.

All together there will be so much to occupy the attention of the American Dental Association members that they will perhaps find themselves hard pressed to get the business of the convention out of the way.

[ORAL DIAGNOSIS]

Much time has been given to the various mechanical designs; many are very elaborate and show great skill, but let us not lose sight of the real keystone in the arch of success and that is to build upon a foundation of security and not one of doubt and frailty. Let us give oral diagnosis more consideration.

—WESTENHAVEN.

DIGESTS

VINCENT'S DISEASE

By Leo Winter, D.D.S., and Louis V. Hayes, D.D.S.

The authors give as an outline of treatment that first proper asepsis must be established. The throat and mouth are washed with a solution of potassium permanganate. The pseudomembrane and other debris are removed and the throat and mouth washed again with the pressure spray.

The mouth is dried, the ducts of the salivary glands being blocked off, and a spirillicide oxidizing agent, an escharotic or a dye is applied. The diseased parts are then swabbed with tincture of benzoin to allay irritation and for stimulation. The diet should be regulated, and a saline cathartic, anodyne, antipyretic, alterative, and antacid mouth wash should be prescribed.

When the infection has subsided the teeth should be scaled and curetted and oral sepsis removed. Thorough toothbrush massage of the gums and the hygienic care of the mouth should be taught. Medicinal therapy is continued, but less frequently. — *The Dental Cosmos,* July, 1929.

EMPYEMA OF THE MAXILLARY SINUS

The author appeals for a more careful diagnosis and a closer cooperation with the rhinologist. A useful tooth should not be removed in order to gain access to the antrum, because it does not give an adequate opening, there is a possibility of reinfection and sometimes the opening closes with difficulty.

Any opening that exists into the antrum from the mouth should be closed as soon as possible. The operation of choice is the intranasal-facial one, with drainage and post-operative treatment through the nose. In general, radical surgical methods should be condemned, because of the extensive destruction of tissue and bone. All large openings should be avoided. They become a source of constant irritation and make it very difficult to effect a permanent cure.—*Journal of the American Dental Association,* July, 1929.

PERIODONTAL DISEASE

By Sidney Sorrin, D.D.S.

There is no single etiological factor of periodontal disease. As a rule it is due to bacterial invasion made possible by a lowered resistance. In less than 10% of the cases diet could be traced as a causative factor. Most people eat a more or less mixed diet and improper eating was found chiefly in children. Mothers and children should be instructed in what constitutes a proper diet. Corrections in the diet, however, should be made only by a physician after a careful examination.

Treatment of local conditions is most important and dentists should be trained in modern methods. In this way definite results will be obtained in at least 85% of the cases.

Success is due to the removal of all local etiological factors, proper instruction in the method of gingival stimulation, and the removal of deposits by correct instrumentation.

Local factors are the etiologic cause in 90% of the cases and traumatic occlusion is the cause in 85% of the cases. The disease is not confined to any particular age group and is about equally divided between males and females. The average age for men is forty-one, and for women, thirty-six.—*The Dental Cosmos,* July, 1929.

Foreign Dental Literature

Edited by JOHN JACOB POSNER, LL.B., D.D.S., New York

INFECTION IN THE FLOOR OF THE MOUTH

By DR. M. WASSMUND, Jaw Department, Virchow Hospital, Berlin, Germany

Next to malignant tumors, infection in the floor of the mouth is the most serious of the head diseases and for a long time had an exceedingly high death rate. It was only after the conservative treatment was given up and surgical intervention preferred that better results were obtained. Even at the present time there still remains a high mortality in these cases.

In swellings and infections in the floor of the mouth there is usually an infective inflammation beginning in one of the spaces such as the submental, submaxillary or sublingual area.

The author refers to more than 350 cases of infection in the floor of the mouth which were treated in his clinic over a period of six years.

There are many causes for this type of infection and among them are dead teeth, infected extraction wounds and operation wounds, pericoronal infection about the third molar, careless local anesthesia, infected fractures, osteomyelitis, salivary gland inflammation with stones in the ducts, infected tonsils, etc.

The main cause for infection in the region of the mandible as well as the cheeks and floor of the mouth is diseased teeth and their sequelae.

It is wrong to believe that only carious teeth can cause infection, or that every carious tooth causes infection. The important consideration is whether or not the pulp is healthy. A deeply carious tooth may have a vital pulp and nothing will happen. On the other hand, a tooth may have a perfect crown with a putrescent pulp and cause serious infection.

When the pulp becomes infected, then the pericementum becomes infected, as well as the bone in the apical area. This condition is periodontitis. A granuloma forms at the expense of the bone in the apical region and may remain in a chronic state for years. Almost all granulomata harbor bacteria, chief among them being the

streptococcus viridans and frequently the streptococcus and staphylococcus, especially the hemolyticus, the diphtheroid and the pneumococcus. These conditions remain dormant for many years, but occasionally become acute with pain and swelling. An abscess is formed and, unless the tooth is extracted or treated, will produce severe symptoms. Despite root treatment, the infected granuloma may still persist as a constant menace to the individual.

The infection from a granuloma may remain as a local condition in the alveolar process, but may also spread through the bone and soft tissues. Many times it makes a small destroyed area at the tooth apex the size of a pea. It may be larger and, by extension, break into the nose, if the infection occurs at the apices of the upper centrals. It may extend into the antrum from the bicuspids or molars. In the mandible it may extend beneath the lower border or move inward to the floor of the mouth.

When the infection breaks through, it may be accompanied by mild symptoms or by acute conditions which may threaten life itself. Thereafter these infections remain as chronic fistulas known as nose, antrum, chin or floor of the mouth fistulas. They will not heal so long as the tooth remains untreated or unremoved. Filling such root canals is insufficient. The apical area must be cleared up and the root of the tooth amputated. Once it is established that the tooth is dead, or, what is more aggravating, that the canal has been improperly filled, it can almost be definitely stated that there is a source of infection at the apex.

The second most frequent consequence of pulpless and infected teeth is the building of root cysts. These cysts are chronic and may grow to the size of a plum within a year. Since it comes from an infected tooth, the cyst is usually infected. Just like a granuloma, it may remain latent, but some time or other it lights up and causes complications just as in the case of the granuloma.

Whereas the granuloma usually heals following the extraction of the tooth, this does not follow for the cyst. If the cyst is small, it often comes out attached to the end of the root. Otherwise the cyst remains behind, becomes encapsulated and continues to enlarge. Thereafter, following a period of lowered resistance, the cyst breaks down and an acute inflammatory condition arises. The acute condition in cases of granuloma or cyst comes on when the virulence of the infecting organism is suddenly increased or the local resistance lowered. Sometimes we are at a loss to determine just how this happens. In certain cases we can follow it clearly, as in cases where a dead tooth is opened and, while treating the canal, some of the bacteria are forced into the apical area with acute results. A traumatic injury such as a blow or a sudden bite upon a dead tooth might prove the activating cause. Grippe, colds and influenza help to bring on acute conditions, and in the clinic it was definitely noticed that patients who had the infectious diseases such as scarlet fever, pneumonia, measles or typhoid with accompanying lowered resistance were prone to have sudden acute symptoms in and about dead teeth. Since the protective forces of

the body have been called to some other point to repel bacterial invaders, the teeth are left without sufficient protection, and instead of being quietly chronic they flame up.

It is not to be expected that in every case of a diseased tooth there are symptoms of pain. There is usually no pain when the infection has produced a fistula which permits the products of the infection to be carried off. Since the pus is not stored up in the bone, it passes into the soft tissue of the cheek or floor of the mouth and is there the cause of inflammation.

It can therefore be seen that the existence of one or more badly decayed or pulpless teeth is frequently the cause of lymphadenitis in the region of the glands. It is not the sudden attack of a virulent infection which involves the gland, but rather the repeated chronic infection which lowers the resistance of the lymphatic glands and so permits an acute infection in the floor of the mouth. The abscess of the lymphatics is often the joining link. This connection is seen in those cases where patients have been treated in hospitals for abscess in the submaxillary region, sometimes over a period of weeks and months with no success. Upon removal of a dead tooth the condition clears up at once.

If, therefore, it is desired to look to the teeth as a possible source of a long-standing inflammation of the surrounding soft tissues, we must remember the following points:

(1) Careful examination of the teeth for caries.

(2) Careful examination of the pulps of suspected teeth and the periapical area.

(3) The mere absence of teeth does not mean that diseased bone is not present.

(4) The x-ray examination is very important and care must be taken that the picture is read correctly.

(5) Absence of pain is no indication of lack of trouble.

(6) Only a careful examination of the teeth can decide whether the cause of the inflammation in the tissue lies with the teeth.

INFECTED EXTRACTION WOUNDS

Quite frequently one sees swelling on the floor of the mouth two to four days after a tooth has been removed. This is especially the case where lower molars have been removed. These patients often come in with an established infection, and it is not infrequent that the patient succumbs on the very day of the extraction. Many times the dentist is blamed, since the inflammation grew worse after the extraction. In these cases it is unquestionably the fact that the infection was already present, and that the tooth extraction came too late. Sometimes there is no visible infection in the mouth, the tooth is extracted and is followed several days later by severe pain. Swelling ensues, the socket is filled with a broken-down blood clot, ill smelling and putrid. The infection in the socket is the cause of the swelling. The patient should always be instructed to return for treatment if the pain in the socket lasts for more than a day or two after the extraction.

There are so many possible sources of infection of the socket through instruments, local anesthesia, the patient's lack of cleanliness, physical

condition, etc., that these things should be given some care. Swelling, osteomyelitis and other complications are due to a combination of surgery and bacterial invasion. Surgery opens up the blood-vessels in the soft tissues and bone. Even when the case heals without complications, the swollen lymphatics serve as an expression of bacterial influence.

Wisdom Tooth

The biting of the upper teeth against the flap of the soft tissues covering the wisdom tooth in the mandible leads to ulceration of the tissue. The infection spreads along the side of the tooth into the bone and soft tissues of the cheek and leads to involvement of the lymphatics of the neck—a lymphadenitis.

Careless Local Anesthesia

The injection of a local anesthetic into a swollen area or even into a chronic abscess will spread infection into surrounding tissues when force is used in discharging the solution.

Infected Fractures

Fractures may lead to swelling in the floor of the mouth, but most particularly when the fracture is at the angle. Here there is rich possibility of infection through the submaxillary area, where there is a large amount of loose tissue. Many cases of infection in the floor of the mouth have persisted for a long time before the fracture was noticed.

Osteomyelitis

In cases of severe acute osteomyelitis there is always an accompanying swelling in the soft tissues. This swelling reaches threatening extensions, lasts many days and may require several operations before even the specialist is led to suspect osteomyelitis.—*Vierteljahrsscrift für Zahnheilkunde,* Vol. I, 1929.

DENTAL ECONOMICS

Investments for Dentists

By WALTER S. KYES, D.D.S., San Diego, Cal.

FOURTH ARTICLE

Ownership of a share of stock in a concern is in no wise similar to ownership of a bond issued by a concern. The share of stock entitles or at least should entitle the holder to a share in the profits of the business of the concern issuing the stock. Likewise it may compel the owner to share in the losses sustained by the company. These losses are made known to the holder through the medium of assessments levied against his stock. If these assessments are not paid, it is customary for the company, acting under state law, to advertise the stock for sale for a given time after the notice has been sent to the holder thereof, and the stock is bid in either by the company or by some other investor or speculator.

It is not an infrequent occurrence for wildcat companies which have found that their business could be made remunerative so to manipulate their affairs that dividends will not be paid for a long period of time, thus discouraging the holders of the stock until they become willing to part with it at a substantial discount. Then it is bought up by the company. In this manner promoters have been known to gain possession of valuable properties almost entirely at the expense of persons who were persuaded to buy stock without knowing its possibilities and without being intimately acquainted with the men in control of the company by virtue of their being on the board of directors.

There are ordinarily two kinds of stock, preferred and common. The preferred may or may not have par value. As the name indicates, preferred stock is preferred as to dividends. The rate of the dividend which is stated on the stock certificate does not increase, no matter what the earnings may be. The common stock is supposed to earn whatever the earnings of the company are in excess of the amount paid or guaranteed on the preferred stock, but it should be remembered that the company in which the stock is held may, from time to time, "pass" the dividend on the preferred stock and pay nothing whatever. A share of stock which states on its face that it is a 7%-bearing stock will pay 7%, only provided that the earnings of the company issuing it warrant such payment.

On the other hand, if the company is prosperous, it may pay not only the 7% on its preferred issues but an equal or a larger dividend on its common stock. In such an instance the common stock would be the more valuable of the

two issues. But should the company involved fail, the preferred stock would of course be first to participate in the assets of the company, provided that anything could be salvaged from the wreck.

When an inexperienced person buys a share of stock in a company which is being organized presumably for the enrichment of the owners of the stock and the promoters, he is led to believe that he is one of the company, an indissoluble unit among the stockholders in the concern. In so far as the debts of the company which may accrue from time to time are concerned he may be; but, on the other hand, his agreement with the company, which is printed on the face of his stock certificate, may prove that the holder of the stock is but a temporary adjunct at most. It is not infrequent for an investor to find, after his stock certificates have been delivered, that printed thereon is a statement something like the following: "After five years from date the company reserves the right to retire this stock at $105.00 (providing the stock has a par value of $100.00), plus the accrued dividends." Then, it is needless perhaps to say, the stockholder wakes up to the fact that he is only one of the company by the grace of the board of directors, and that when the stock becomes a safe investment through the establishment of the company as a going and growing concern, he is paid off and ruthlessly thrown overboard, so to speak. This means, of course, that he was only a figurehead whose function was to help finance the company through the more or less perilous years of its development.

Before turning money over to a stock salesman a person should demand to be shown a copy of the stock certificate, and in the absence of this he should, if it is deemed wise to invest at all, make an arrangement with his banker or broker so that his cash will be held in safe hands until such time as the stock certificate is available for inspection.

The purchase of stock in any concern should not be concluded after thirty minutes of conversation with a salesman. As a rule, he is concerned only about his commission, which may run from twenty to thirty per cent. This of course applies to companies under promotion. In purchasing stock in an established concern, whether it be oil, gold mines, motors, transportation, apartment houses, hotels, banks, or what-not, the procedure is simplified. A reputable broker or one of the various companies organized for brokerage purposes can give the prospective purchaser an intimate life history of almost any concern consisting of facts and figures as to the reliability of the concern in question and also as to its present financial condition, which includes its assets and debts, its available resources, its dividends, its markets and its possible future outlook for business. With such listings the writer does not propose to deal, but rather with promotions which are peddled by salesmen from door to door.

The first consideration with regard to a new issue of stock is, who are the men back of it? The second consideration is, can you afford to lose? Under the first heading you should stop and ask yourself whether or not the men promoting the company in

question are worthy of the trust. In other words, are they the sort of men whom you would desire to have handle, invest and control your savings?

The writer recalls an instance when he was solicited by a salesman and urged to purchase shares of stock in a chain of so-called loan banks. On the letterhead which the salesman displayed were printed the names of an ex-secretary of state and an ex-governor, both of whom were office-holders in the concern. It developed upon investigation that they were just politicians out of politics with neither of whom the writer would have cared to trust his savings. Their names, it appeared, only lent glamour to the proposition without giving it any intrinsic value.

In regard to the men who might be backing any proposition there is just one thing to be said, that is, if you cannot determine particularly just who and what they are, do not trust them with your savings. You should also endeavor to find out what experience they might have had which would especially fit them for the enterprise upon which they propose to embark at your expense. Are they winners or are they losers? If they are losers, can they be made to win with the support of your savings?

While the probable demand for a product to be manufactured is a difficult thing to analyze, it is worthy of careful thought on the part of the investor. Among other things he might ask himself this question with profit—is the proposed product likely to create a universal demand? He might well inquire as to its available raw materials and the expense of putting it on the market, which, under present advertising costs and distribution costs, is something tremendous. He should inquire also as to patent rights owned by the company, the influence of tariffs on marketing conditions, competition, and the like. Will the product be something which people will like to eat, or wear, or use, in the promotion of health or happiness? And last, but not least, is the proposition an investment, a speculation or a mere gamble?

If the prospective investor cannot answer these questions, it would profit him to put his earnings into something that would stand analysis in terms of his understanding. Otherwise he stands to lose and continued losses during one's productive years mean hardships and, not infrequently, suffering during old age.

812 Watts Building

PRACTICAL HINTS

THIS DEPARTMENT IS NOW BEING CONDUCTED FROM THE OFFICE OF THE DENTAL DIGEST. TO AVOID UNNECESSARY DELAYS, HINTS, QUESTIONS AND ANSWERS SHOULD BE ADDRESSED TO EDITOR PRACTICAL HINTS, THE DENTAL DIGEST, 220 WEST 42D STREET, NEW YORK, N. Y.

NOTE—Mention of proprietary articles by name in the text pages of THE DENTAL DIGEST is contrary to the policy of the magazine. Contributions containing names of proprietary articles will be altered in accordance with this rule.

Editor, Practical Hints:

During the past few years I have had to care for a patient with pyorrhea. It was impossible to do much for him in way of treatment, as the mere placing of cotton rolls in the mouth caused nausea. For the same reason any other work was extremely difficult. Eventually he needed a full upper plate and by dint of much perseverance I succeeded in making a good plate with apparently no leaks around the edges. But after he has it in for a few seconds he gags and it has to come out—sometimes with difficulty. He persuaded me to cut away part of the posterior palate, but this did no good, and I restored it well up to the soft tissue. The suction is again satisfactory, but now (as all the way through) he is still nauseated by the presence of the plate in the mouth. On his last visit I swabbed the palate with procaine (even this was risky), after which he could retain the plate for a minute or so at a time.

B. C.

ANSWER.—You are up against one of the most discouraging features of dentistry. You have done your part and it is now up to the patient to do his. He must make up his mind that he is going to wear the plate. Sometimes if the patient will put in a plate and keep it in no matter what happens, the difficulty is overcome. It may take several trials. It all depends on the mental attitude of the patient.

Editor, Practical Hints:

What is the best method for removing a sensitive pulp in the apical third of a root canal? I am referring to cases where the pulp could not be removed in its entirety at the first attempt and was left until the following sitting on account of sensitivity or inaccessibility at the apical third.

J. J. S.

ANSWER.—When only a few shreds of pulp tissue are left it is sometimes possible to destroy them by working 50% sulphuric acid into the canal. Some men use a small amount of arsenic, but this method is open to objections, and great care must be exercised.

If part of the canal is inaccessible, then access must be gained by mechanical means, such as files, etc., for if it is not possible to reach the end of

the canal to remove the pulp it will be impossible to satisfactorily clean and fill it.

Editor, Practical Hints:

I have a case upon which I should greatly appreciate some advice.

I made a set of plates about a year ago for a man about 50 years of age. He got along very well for about seven months, and since that time he has had an excessive amount of saliva. At times it makes him sick and he has to take his plates out.

He has been under the care of a physician for the last three months, but he cannot find what the trouble is.

There are two pins of the lower plate exposed and the physician thinks that they are causing the trouble. He thinks they are causing metallic poisoning.

The plates do not fit as well as they did at first, but he can use them all right. They are made out of vulcanite. Do you think the plates could cause the trouble?

H. J. C.

ANSWER.—Since the trouble did not start until after the patient had been wearing the dentures for seven months, it is very doubtful if the dentures are the cause of the excess saliva. Metal poisoning from exposure of two pins is so unlikely that it can be ruled out as a factor.

The excessive saliva is probably due to the reflex action of some systemic trouble or to a nervous affection.

Answer to E. C. M.—Enclosed is my analysis of the case as outlined by E. C. M. in the July issue of THE DENTAL DIGEST.

During the extraction of the first molar and roots considerable trauma and laceration occurred, if not, then the patient was in poor health and the tissue did not respond and heal as it would in a healthy person. When the roots were extracted, the elevator or forceps injured the roots of the second molar which is now being used as an abutment. If this is not the case the grinding, trimming and preparation of the molar abutment caused a deleterious reaction in the pulp, or else the molar crown was high on occlusion and injured the pulp.

If this patient is still returning, he must have a lot of confidence in E. C. M., and if he still wants to use the second molar after all this suffering, what is the reason for not devitalizing? My answer would be to extract the second molar, as ten to one it is the whole cause of the trouble.

I find that potassium permanganate tablets, 2 grains to a glass of water, is very fine for quick healing after extraction.

G. E. C.

ANSWER to E. C. M.—In the attempt to solve the problem of the case presented by E. C. M. in your July issue, the following suggestions may be made leading to probable solution.

The phenomena of pain produced about the face and teeth as described may most probably be the result of a reflex neurosis with the source of irritation being either situated in or about the other remaining teeth or in a location other than about the teeth, such

as some systemic disorder elsewhere, despite the "good family history."

But to restrict our problem to the dental field exclusively, this reflex neurosis might have originated from some preexisting focus of irritation, since the fact is mentioned that "the third molar had been removed years before." The chances are that a latent focal infection might have been left, or a granuloma possibly has not been removed. Therefore, the history of the extraction should be obtained if possible, along with a complete radiographic examination of the entire oral cavity. A careful investigation for peripheral irritants may disclose the original or a latent irritation.

Since "neither the tooth nor the gum would allow any pressure . . . without starting *some pain, which seemed to be in the bone itself*" (italic mine), it is quite evident that the pain may be due to a cicatricial inclusion of some of the nerve terminals, consisting of a compression of nerve endings by dense bone, responding to the slightest irritation, such as pressure along that area. If this be the case, and corroborated by radiographic findings (e.g., a well-defined radiopaque, eburnated area), the bony tissue may be broken up and the bone whorl found in the localized pain spot removed.

In order to definitely establish, however, the particular nerve terminals involved, it would be advisable to trace the various nerve supply courses by successive novocain injections. If no pain to pressure follows a certain given injection, the conclusion may be evidently drawn that the disturbance lies somewhere along that particular nerve.

H. E. P.

ANSWER to P. R. L.—I noticed a question asked in July by P. R. L.

I think the trouble can be relieved by scraping the plate where it rests over the posterior and palatine nerve.

I have had some patients complain of their plates making them tired. If you will scrape the plates in the same spots it will relieve them most of the time.

E. D. P.

STERILIZING ALL-GLASS SYRINGES.—In the June, 1929, issue of THE DENTAL DIGEST, page 410, your correspondent L. T. A. complains of trouble with his all-glass syringe, which he very properly takes apart for boiling. In your reply, you note the necessity for both parts of the syringe having the same coefficient of expansion, or else of waiting for the syringe to cool before using.

Usually both parts are made of the same glass, and have, theoretically, the same coefficient of expansion; but in practice, it also usually happens that the barrel will cool faster than the plunger, because the heat must naturally pass from the plunger to the barrel, then on to the surrounding atmosphere before it can be given off, and the syringe can cool, therefore the barrel is always cooler than the plunger, and the latter easily binds.

The method used in my office is to wash the syringe in plain water immediately after use, boil the parts separately, and keep them apart in strong alcohol. Thus the syringe is constantly sterile and ready for immediate use. All that is necessary then, is to pass one or two c.c. of the anes-

thetic through the syringe to wash out all traces of alcohol, flame the needle after discarding the solution used for cleansing the syringe as well as before, and draw sterile solution into the syringe. You are then ready to inject, and the plunger will never bind seriously. Pressing the plunger with a slight rotating movement will do away with any danger of binding with this technic.

JAMES T. QUINTERO,
Editor, *La Province Dentaire.*

[DENTISTRY MUST DEVELOP]

If dentistry as now organized does not develop the full health service equivalent of an oral specialty in medicine, public interest will ultimately require the creation of a specialty of medicine to render oral health service. —PRITCHETT.

CORRESPONDENCE

Editor, THE DENTAL DIGEST:

While I do not pretend to be a writer, I think that I do know a little bit about therapeutics, and not as it is taught in a dental school, either. The trouble with therapeutics as taught us as students is that our teachers are only theorists and not practitioners. In other words, the course is bunk. I do not know how the course can be corrected except by increasing the salary if that is necessary to get some one who has practiced or does practice and use therapeutics. Possibly some of the teachers may be induced to do a little studying too, and learn a little bit about what they are trying to teach instead of passing out so much theory.

Probably all therapeutic courses are not so bad as the course I received. For instance, I should like to know what sense there is in getting a student to pick out a powder and identify it by its appearance, when so many powders look alike. Would any practitioner be fool enough to try to guess between sodium bicarbonate and arsenic trioxide? Hardly! Another fault is the idea which is passed out that the same dose of a drug will act the same on each patient.

I was taught to use 1/40 of a grain of strychnin. Is that the dosage of the average tablet of strychnin? No, it is not. One can scarcely buy a 1/40 grain tablet for hypodermic injection. You will use, as a rule, either 1/60 or 1/30 grain and very often when strychnin is necessary a larger dose is required.

Ask the average dentist if he uses strychnin and he will say, "No, I am afraid of it." Of course it is a dangerous drug, but it is often necessary to resort to its use—especially if one gives anesthetics.

It may be well to remember that often we must give a drug to the physiological limit to get the action desired. The physiological limit varies with different conditions such as age, and how the drug is administered, and the size of the patient.

Some drugs act much more quickly when given by a needle than by the mouth, while others act in the opposite manner. Strychnin is an example of a drug which acts more quickly by the needle than by the mouth, while glonoin acts more quickly by the mouth. Fibrogen acts much more quickly when given by the mouth than when given by the needle. Strychnin when given by the needle need be only half the dose given by the mouth to get the same result.

Suppose an overdose of strychnin is given, what would most of us do? Probably most dentists would call a physician. That kind of therapeutics will not suffice. Every dentist will do well to have a medical materia medica and therapeutics at hand so that he at least can find the antidotes to the

drugs used in his office. Strychnin acts on sensory nerves and motor nerves as well. Therefore we must use drugs which will counteract the action of both sets of nerves. Bromids act on the sensory nerves while chloral acts on motor nerves, and I believe these two drugs are probably the best physiological antidotes for strychnin poisoning. Amyl nitrite should be administered until an astringent has been used to wash out the stomach to prevent absorption of the strychnin if the drug has been taken by the mouth. Tannic acid is the astringent of choice.

Another drug we are taught to use is spirits of ammonia. How much spirits of ammonia were you told to use in case a patient felt faint? Probably you were taught to use about fifteen drops. Well, perhaps that would be enough for a child, but for an adult, especially if well advanced in age, at least half a teaspoonful (30 drops) would be necessary, and I would repeat this in fifteen or twenty minutes if the case required it.

How many of you remember how to produce artificial respiration? Every dentist should know how to resuscitate a person by artificial respiration. It is a part of your therapeutics.

Gentlemen, I am proud to be a dentist, but when most of our medical brothers look at us with a sneer it makes me disgusted. These sneers come because we do not know medical terminology. Of course we are not versed in all the phases of medicine, and on the other hand the physician should not be so narrow as to think that he knows so much more than we do. However, we should know enough of medical terminology to talk with the medical man and know what diseases are associated with the teeth.

The next time one of the medical profession sneers at dentistry in the presence of a dentist I hope the dentist will say, "Dr. A., you think I am ignorant because I do not know all there is to know about your profession. Now I will venture that I know more about your profession than you know about mine. Do you know the anatomy of a tooth? Do you know the names of all dental instruments? Do you know how to make various types of artificial dentures? No, you do not. Are you able to anesthetize your patients for tonsillectomy with a local solution with success in as great a number of cases as I am able to anesthetize my patients for extraction? You cannot, and it is not because it is impossible, but it is because you do not study that branch of your work as much as I do mine."

Now, for the good of the dental profession let us know the therapeutics which are necessary for the practice of dentistry.

Also remember, when the other fellow sneers, that he is forgetting that he is not perfect and is no doubt exposing a part of his ignorance.

In the interest of the dental profession, I am

Yours truly,

(Signed) W. E. ANNIS.

DENTAL SECRETARIES and ASSISTANTS

Secretaries' Questionnaire

All communications should be addressed to Elsie Pierce, care of THE DENTAL DIGEST, 220 West 42d Street, New York, N. Y.

NOTE—HAVE YOU A BETTER WAY? HAVE YOU A TIME-SAVING SHORT CUT? DO YOU KNOW A "STUNT" THAT LIGHTENS THE WORK OR MAKES FOR GREATER EFFICIENCY IN THE OFFICE? IF SO, WRITE TO ELSIE PIERCE. YOU MAY HELP MANY GIRLS WHO ARE BEGINNERS—AND YOU KNOW HOW YOU NEEDED HELP DURING YOUR FIRST FEW MONTHS IN A DENTAL OFFICE. PERHAPS YOU NEED HELP NOW. WRITE TO ELSIE PIERCE—SHE WILL HELP YOU.

In a number of the communications received by this department the thought is expressed that the Questionnaire should be longer and contain more material. The purpose of the Questionnaire is to serve as a clearing house for the problems of its readers, and also as the recipient of ideas and suggestions from its readers that will help the young women who are employed in dental offices. In those offices where the assistant has served a sufficient length of time to acquire experience in her work she has learned or developed many methods for easier and better service. To her these methods are but a part of the daily routine and perhaps not valued so highly as they should be. To other assistants who are new in the service these various methods, tricks, short cuts, time-savers, stunts, etc., would be of great help.

Aside from welcoming questions, we should appreciate suggestions and ideas. If we receive an increased number of both, the Questionnaire will be more extensive and contain a greater variety of material. In this way we should make all our readers happy and with the help of our correspondents make the department bigger and better each month.

Yours for service,

ELSIE PIERCE.

Dear Miss Pierce:

I wonder if you could tell me of a solution that would clean the instruments of rust and other stains. I should like to have them look new and shiny.

B., Portland, Oregon.

ANSWER. — To keep instruments bright and shiny requires constant care. The occasional application of a solution that would remove rust or other stains would not accomplish the results you expect. However, to remedy the present situation we suggest that you remove all traces of rust and stains by polishing off with powdered pumice or one of the household polishing mate-

rials, finishing off with rouge such as you use for polishing gold. You can do all this on the laboratory lathe, using a medium-stiff brush wheel for the abrasive material and a felt wheel for the rouge.

And now for suggestions to prevent the rust and stains. First, all instruments should be cleaned as soon after use as possible; secondly, they should be thoroughly dried and kept dry. In the cleaning they should be thoroughly scrubbed with a brush and hot soapy water, so as to remove all debris, and then placed in the sterilizer. The sterilizer water should be clean and the sterilizer itself thoroughly cleaned every day. To the water should be added a non-rust solution of some kind or some bicarbonate of soda or borax; some offices use a few drops of liquid petrolatum or a bit of vaseline or paraffin in the water. Once a week all instruments should be thoroughly gone over and carefully polished with the felt wheel and rouge. As previously stated, to keep the equipment and instruments in good condition requires constant care and vigilance. If they become corroded from rust and other stains, the only thing to do is to have them renickeled.

Dear Miss Pierce:

I wonder if you can tell me if there is any college, not necessarily in New York, that has a course for dental hygienists that does not require a high school diploma. I left high school in my eighth term because of illness and never returned. I have been an assistant for over two years. Would that be of any advantage?

Are dental assistants, not licensed hygienists, permitted to do prophylaxis if they are instructed by a dentist?

Also, can you tell me the best way to keep instruments bright? About three times a year I polish them with a silver polish. I have heard of the use of liquid petrolatum for this purpose, but I do not know how to use it. Is it diluted with water, and, if so, what percentage? How often is it necessary to do this?

P. L. S., N. Y. C.

Answer.—We do not know of any college having a course for dental hygienists that does not require a high school diploma, or its equivalent, for matriculation. Why do you not make up the few points you lack in your requirements by attending night school? Surely you cannot lack many if you were in your eighth term. Why not do it this coming winter and have the satisfaction which would accrue to a high school certificate?

Two years of general assisting should be of help to you in training as a dental hygienist.

In those states where the practice of dental hygiene is regulated by law an assistant cannot practice as a dental hygienist unless she has a license as such for that state. New York is one of these states. Where there are no such laws, the dental law would govern all dental procedure, and oral prophylaxis is a part of dental procedure. Write to Dr. Minor J. Terry, Educational Building, Albany, N. Y., for further information.

The answer to B., Portland, Oregon, in this issue on the care of instruments should help you. The liquid petro-

latum is no doubt used in the sterilizer, as indicated, to prevent rust.

Dear Miss Pierce:

I have been reading in the July issue about how to remove modeling compound from impression trays. Can you suggest a way without a Bunsen burner, as we do not use one in the laboratory?

R. W., Pa.

ANSWER.—Use any flame. It does not have to be a Bunsen burner. An alcohol lamp will answer just as well. The idea is to heat the tray and lubricant over a flame, otherwise the trays will have to be boiled in a solution containing soap flakes or soap powder, and, as we have mentioned elsewhere, this will discolor the trays because of the alkali in the soap preparation.

Dear Miss Pierce:

Will you kindly tell me how to remove water or, shall I call it, rust stains from the cuspidor?

V. M., N. Y. C.

ANSWER.—We have printed this several times before. However, we are glad to print it again. Use a strong solution of oxalic acid applied with a stiff brush of the type of a mucilage-bottle brush. Do not allow the acid solution to come in contact with the chair, unit, hands or uniform, as it is very caustic.

Dear Miss Pierce:

Will you please send me some information about dental assisting? I have had no experience in this line of work and should like to be as efficient as possible.

H. M., S. D.

Dear Miss Pierce:

I have been assisting in a dental office for a week and find things rather difficult because of no previous training. I am seventeen years old and a high school graduate. Any information you can send me in regard to my work will be appreciated.

A. E. B., Mich.

ANSWER.—To cover the entire subject of dental assisting in its many phases would take more space than is available; in fact, it would fill a book. You cannot hope to learn to become an efficient assistant in a few days, weeks, or even months. If you would be more specific and state just what your particular problems are, we should be very glad to help you as far as possible. We can only advise you to seize every opportunity for learning that comes your way in the course of the day's work. Encourage the doctor to teach you those things that seem to be most needed, and the additional details will gradually be mastered. Read all the literature that comes into the office on dental assisting, supplement this with data on economics, hygiene, practical psychology, sterilization, care of equipment, x-ray, general laboratory procedure, etc., and also any literature that touches upon the specialty that may be practiced in your office, so that you will better understand the terms used and the needs of the patient and the doctor. Join a society for dental assistants and

attend all the classes and clinics. Time and experience, plus application to your work and concentration, will bring you knowledge.

Educational and Efficiency Society for Dental Assistants, First District, New York, Inc.

A regular meeting of the Educational and Efficiency Clinic Club will be held at the office of Dr. S. Abraham, 20 East 57th Street, New York, N. Y., on Monday, September 16, 1929, at 7:30 p. m. The program will include a lecture-clinic on *Several Important Phases of Orthodontia in Relation to the Dental Assistant* and the discussion of plans for the clinics to be presented by the Educational and Efficiency Society for Dental Assistants, New York, as part of the presentation by the Dental Assistants Association of the State of New York at Washington, D. C. during the annual meeting of the American Dental Assistants Association in October, 1929. All members of the Society are invited to attend.

The Clinic Club strives to show the ways in which the assistant can be of service to the dentist and patient and, through discussion and the interchange of ideas, to evolve more efficient methods of dental assisting. For the sake of expediency the material in the Club is divided into several sections individually representing the various phases of dental assisting and, as a whole, embodying the routine work of one dental assistant. There are departments on secretarial assistance, chair assistance, sterilization, x-ray and laboratory assistance, first aid, care of equipment and instrument-sharpening, and surgical assistance, each demonstrating the service for which it is named. These sections have been arranged into table clinics for study at the regular meetings and for presentation before national, state and local dental societies and dental assistants' societies.

The Clinic Club meets regularly on the third Monday evening of each month, September to May, inclusive. All members of the Educational and Efficiency Society for Dental Assistants, New York, are eligible to join.

The Educational and Efficiency Society for Dental Assistants, First District, New York, will resume its activities in October. Meetings will be held regularly on the second Tuesday evening of each month, October to May, inclusive, at the Academy of Medicine, 2 East 103rd Street, New York, N. Y., when addresses will be made by prominent physicians, dentists and club-women. Classes will be held as usual on subjects pertinent to dental assisting, such as bookkeeping and accounting, telephone courtesy, public speaking and parliamentary procedure, sterilization, diet, anatomy of the head, practical psychology, x-ray assistance, laboratory technic, chair and surgical assistance, first aid. These classes are given free to members, one evening each week, under the direction of competent instructors.

The Society owns a library of articles and books on dental topics, a scrapbook showing the history of dentistry in pictures, and a book of practical suggestions containing many helpful hints for efficient office procedure.

Janet Yates, Librarian, may be addressed c/o Dr. Eolis, Times Bldg., Times Square, New York.

Dental assistants employed in ethical dental offices are eligible for membership and are urged to take advantage of the many opportunities for education that such membership offers. The Society does not conduct a registry nor is it connected with commercial enterprises. Its motto is *Greater Education for Greater Efficiency.* The President, Ethel R. Meyerson, may be addressed at 27 West 86th Street, New York.

A cordial invitation to attend the meetings of the Society is extended to the members of the dental profession and to their assistants.

["TRENCH MOUTH"]

The treatment of acute Vincent's infection is simply a process killing the bacteria by use of certain drugs, thorough prophylaxis of the mouth and removal of all gingival irritants.

—MOORE.

BOOKS RECEIVED

A BOOK MAY BE AS GREAT A THING AS A BATTLE—DISRAELI

Dental Histology and Embryology, by B. Orban, M.D., Professor of Dental Histology and Pathology, Chicago College of Dental Surgery, Dental Department of Loyola University.

It was a year ago that we received a copy of the first edition of this work, and it is evident that it has attained the popularity that it deserves. There have been several slight changes, and the addition of an index has added greatly to the usefulness of the book.

Orban was an associate of Gottlieb in Vienna and has brought to this country an enviable quality of research. The subject is treated clearly and concisely and the illustrations are profuse and exceptionally fine. It is a book that can be unreservedly recommended.

213 pp., with 201 illustrations and index. Philadelphia, Pa.: P. Blakiston's Son & Co., Inc., 1929.—A. M. J.

Full Denture Procedure, by Victor H. Sears, D.D.S., Professor of Prosthetic Dentistry, New York University College of Dentistry.

This book gives the author's technic for the construction of vulcanite dentures, together with the use of channel teeth.

128 pp., with 56 illustrations and index. New York, N. Y.: The MacMillan Company, 1929.—A. M. J.

Index of the Periodical Dental Literature, compiled by Arthur D. Black, A.M., M.D., D.D.S., ScD., Dean of Northwestern University Dental School.

The latest volume of the Index has just been published and covers the period from 1924 to 1926. It is a valuable work, and the editor deserves all possible credit for this undertaking.

Buffalo, N. Y.: Dental Index Bureau, 1929.—A. M. J.

Dental Anatomy, A Graphic Presentation of Tooth Forms with an Original Technique for Their Reproduction, by M. Diamond, D.D.S., Associate Professor of Dentistry and Head of the Department of Dental Anatomy, Columbia University Dental School.

The reproduction of tooth forms has always been a weak point in dental teaching and practice. Many practitioners think that they have done a satisfactory piece of work when the cavity has been filled, the contact point established, and the restoration freed from interference with the opposing teeth. Bridgework has been notably lacking in anatomical occlusion.

The author of this book has reduced the art of reproducing tooth forms to its fundamentals, disregarding the

numerous variations and anomalies that are found in the natural teeth. The underlying basic principles are shown and the variations may be added later. In this way the essential scheme of nature is impressed on the student.

276 pp., with 100 illustrations, glossary and index. New York, N. Y.: The MacMillan Company, 1929.—A. M. J.

EXTRACTIONS

No Literature can have a long continuance if not diversified with humor—*ADDISON*

A little moonlight now and then, will marry off the best of men.

(Pretty Nurse)—Every time I take the patient's pulse it gets faster. What shall I do?
(Doctor)—Blindfold him.

It's a funny thing, but you never hear of a Mediterranean fly or weevil of any sort going around putting the spinach crop on the blink.

A scientist has discovered that fear reactions originate in the brain. That explains why it's next to impossible to scare some people.

(Jimmy)—Daddy, I dreamt last night that you gave me a dime.
(Dad)—Well, as you have been a good boy lately you may keep it.

Experiments show that electricity is the cause of life. So it seems, after all, we are nothing but a lot of current events.

(Hubby)—Gee whiz! My razor doesn't cut at all this morning.
(Wifey)—Why, George, you don't mean to tell me that your beard is tougher than that oilcloth I cut up last night!

(Willie)—I went to the dentist yesterday. Fooey, what a day!
(Jack)—Does the tooth still ache?
(Willie)—I don't know, he kept it.

California has not as yet been invaded by the fruit fly, which is bring'ng distress to Florida. Is it possible that the Western oranges have no insect appeal?

It was a Scotchman who tried to cross his bees with lightning bugs so that they could work at night.

This summer, as never before, the girls have been demonstrating that they have plenty of backbone.

THE LULLABY LIMITED

(Doctor)—I will give you a local anesthetic if you think it necessary.
(Railroad Man)—Well, Doc, if it's going to hurt, I reckon you had better cut out the local and run me through on a sleeper.

The captain of a small trading vessel wanted to land some contraband stuff at a certain port. Approaching the customs officer, he said: "Joe, if I put a ten-shilling note over each eye could you see?"
"I could not," said Joe. "And if I had one in me mouth I couldn't speak."

(A Swell Girl—fitting on her new shoes)—I say, pop, these Louis the Fourteenth shoes I bought yesterday are actually too small.
(Pop)—Well, return them and get Louis the Fifteenth size.

It's a dull day in the news when a search plane isn't being sent out to hunt for the search plane that was sent out to hunt for the search plane that went out to hunt for the plane that got lost in the first place.

(Jones)—My office boy whistles while he works. He's a fine boy.
(Smith)—You're lucky. My boy only whistles.

The average schoolgirl's diary is a *him* book.

Information booths are questionable places.

The King of Sweden and his Queen have been happily married for forty-eight years. However, as you may know, Sweden is the home of safety matches.

SOME STUNT

No matter how long it rains, the famous Taj Mahal mausoleum in India leaks three drops of water, never more nor less. After 300 years no one has been able to explain how the architect arranged for the phenomenon, which was intended as his own unique memorial.

A California orchard owner suggests a debate on "Did Adam or Newton do the most for the apple?"

(Teacher)—A quadruped is something that goes on four feet, and a biped is something that goes on two feet. Now, Jimmie, will you name a biped?
(Jimmie)—Yessum, a pair of shoes.

FUTURE EVENTS

THE ST. LOUIS STUDY CLUB OF DENTISTRY, organized in 1919 for the purpose of teaching advanced dental subjects to ethical dentists, without charge, will open its 1929-1930 term early in September.

The sessions will be held from 8:00 to 10:00 p. m. on Wednesdays. All classes will be given at the St. Louis University College of Dentistry.

The following subjects will be covered during this term:

Dental Roentgenology
Fixed Bridge Technic
Full Dentures
Dental Ceramics
Conduction and Local Anesthesia
Tooth Form and Cavity Preparation
Rizadontia (Root-Canal Technic)
Operative Dentistry
Oral Prophylaxis
Dental Economics
Anatomy and Dissection of the Head
Oral Diagnosis and Diseases of the Mouth

Bulletins giving detailed information regarding the Study Club and its courses may be had by addressing

DR. FRANK C. RODGERS,
309 Wall Bldg., St. Louis, Mo.

THE AMERICAN ACADEMY OF PERIODONTOLOGY will hold its annual meeting at the Hotel Carlton, Washington, D. C., October 3-5, 1929.

JULIAN SMITH, *President,*
1107 Medical Arts Bldg., Dallas, Texas.
CLAYTON H. GRACEY, *Secy.-Treas.,*
269 Rowena Ave., Detroit, Mich.

EASTERN DENTAL SOCIETY

SCIENTIFIC SESSION

Thursday Evening, October 3, 1929

Meeting Place: 425 Lafayette Street, New York

Essayist: James P. Ruyl.

Subject: *A Simplified Technic of Modeling Compound Impressions.*

Illustrated with lantern slides.

Essayist: Francis Scott Weir.

Full Denture Construction for the General Practitioner.

Illustrated with lantern slides.

Round Table Discussions (in Amphitheatre)—8:15 P. M. Sharp.

Subject: *Full Dentures for the General Practitioner.*

Leader: H. E. Tompkins.

EASTERN DENTAL PROGRESSIVE CLINICS

A series of clinics covering the subject of *Full Dentures* in detail will begin promptly at 7:30 P. M.

Clinicians: Joseph Ader—*Full Dentures.*
Herbert R. Berger—*Rebasing of Full Dentures, by an Original Technic.*
M. M. Bogdonoff—*Taking the Bite Scientifically (Centric Relation Record).*
Samuel S. Eisner—*Full Upper and Lower Impressions in Compound.* (Practical Demonstration on Patient.)
M. Goldenberg—*Tooth Arrangement.*
L. G. Jordan—*The True Meaning of Unstrained Intermaxillary Records and How They May be Obtained.*
Joseph S. Landa—*Importance of the Face-Bow Record from a Theoretical and Practical Standpoint.*
Vethake E. Mitchell—*The Prosthetic Treatment of Congenital Cleft Palate.*
Max M. Schwartz—*The Schwartz Simplified Technic of Full Denture Construction for the General Practitioner.*
Paul Shapiro—*Double-Tray Impression Method for Full Dentures in Plaster.*
S. J. Sheckter—*Some Essentials in Constructing Full Upper and Lower Dentures.*
S. Waterman—*Impression Technic for Full Lower Denture.*

PAUL DAVID, *President,*
LOUIS LERNER, *Chairman Executive Board,*
11 West 42nd St., New York.

THE SUPREME COUNCIL, ALPHA OMEGA FRATERNITY, will hold its pre-convention meeting at the Burlington Hotel, Washington, D. C., on Monday, October 7, 1929. The meeting will be followed by a dinner for all attending fraters.

Those expecting to attend should notify Dr. W. I. Ogus, Farragut Apts., Washington, D. C. Make hotel reservations direct.

By order of Samuel Birenbach, *Supreme Chancellor.*

A. M. FLASCHNER, *Supreme Scribe,*
419 Boylston St., Boston, Mass.

Fraters:

A new directory is to be published. Your

full name, address and school with class year are requested.

THE BALTIMORE COLLEGE OF DENTAL SURGERY, Dental School of University of Maryland, Baltimore, Md., will dedicate its new Dental Building on Saturday, October 5, 1929. This day will be known as Alumni Day; Friday, the 4th, will be Class Reunion Day; Sunday, the 6th, will be Recreation Day; Monday, the 7th, the meeting will go to Washington, D. C., to attend the American Dental Association Convention.

In the near future a chairman will be appointed from each class to get his classmates together for a grand reunion.

HORACE M. DAVIS, *Chairman,*
Dedication Committee,
Medical Arts, Bldg.,
Baltimore, Md.

WALTER E. GREEN, *Chairman,*
Class Reunion Committee,
2958 West North Ave.,
Baltimore, Md.

THE FELLOWS OF THE INTERNATIONAL COLLEGE OF DENTISTS will hold a meeting at the Mayflower Hotel, Washington, D. C., October 7-11, 1929, at a time not in conflict with any of the activities of the American Dental Association, or with its affiliated or associated organizations.

LOUIS OTTOFY, *Registrar,*
175 Vernon Terrace,
Oakland, Cal.

THE SOUTHWESTERN DENTAL SOCIETY will hold its annual meeting in El Paso, Texas. Time—October, just prior to the meeting of the A. D. A. in Washington, D. C.

We are desirous of putting on this program by members of the A. D. A. who live in the West and can arrange to stop off en route to the Washington meeting.

All members of the A. D. A. are most cordially invited to bring along their papers, clinical material and dental ideas and help us make a big meeting.

Along with your clinical material bring your golf clubs and nerves toned for a real Mexican bull fight and other delights to be found just across the silvery Rio Grande.

Come and be our guests.

Address all communications to

L. A. NEIL, *Chairman, Program Committee,*
809 First National Bank Bldg.,
El Paso, Texas.

THE AMERICAN DENTAL HYGIENISTS' ASSOCIATION will hold its sixth annual convention at Hotel Powhatan, Washington, D. C., October 7-11, 1929.

Make your reservations early.

AGNES G. MORRIS, *General Secretary,*
886 Main St., Bridgeport, Conn.

THE INDIANA BOARD OF DENTAL EXAMINERS will meet at 8 A. M., November 11, 1929, at the State House, Indianapolis, Indiana, in the room of the House of Representatives, for the purpose of examining all applicants with proper credentials. Applications should be in the hands of the secretary one week before the Board meeting.

For applications, clinical requirements and other information, address

J. M. HALE, *Secretary-Treasurer,*
Mt. Vernon, Indiana.

THE CONNECTICUT DENTAL COMMISSION will meet at Hartford, Conn., on November 18-21, 1929, for the examination of applicants for license to practice dentistry and dental hygiene and to transact any other business proper to come before it.

Applications should be in the hands of the Recorder at least one week before the meeting. For application blanks and further information, apply to

ALMOND J. CUTTING, *Recorder,*
Southington, Conn.

THE FIRST AND SECOND DISTRICT DENTAL SOCIETIES will continue the series of meetings which were formerly conducted by the First District Dental Society and widely known as the December Meeting for Better Dentistry. The meeting this year, which is the fifth annual meeting, will therefore be conducted jointly by the two societies at Hotel Pennsylvania, New York, N. Y., December 9-13, 1929.

Among the essayists and clinicians who have accepted invitations to be present are Wallace Seccombe, Toronto, Canada; John B. LaDue, J. R. Blayney, Chicago, Ill.; Chalmers J. Lyons, Ann Arbor, Mich.; Charles A. Lane, Albert L. LeGro, P. Kyprie, Detroit, Mich.; Dayton D. Campbell, Kansas City, Mo.; James M. Prime, Omaha, Neb.; Hugh W. McMillan, Cincinnati, Ohio; and Theodore W. Maves, Cleveland, Ohio.

The meeting will be continued on the same plan as previous meetings, namely, one fee admitting a member to all lectures, clinics, etc.

A subscription blank and list of clinics will be ready for circulation by November 1st.

There will be a manufacturers' exhibit in the hotel during the meeting.

JOHN T. HANKS, *Chairman.*

THE FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK will hold its Fifth Annual December Meeting for Better Dentistry at the Hotel Pennsylvania, New York, December 10-14, 1929.

The officers of the Society have made arrangements to continue the meetings on the same plan as heretofore, and expect that the profession will again support them in making this meeting a success.

THE CHICAGO DENTAL SOCIETY

SIXTY-SIXTH ANNUAL MEETING AND CLINIC

JANUARY 13-15, 1930

The Chicago Dental Society wishes to announce the 1930 Annual Meeting and Clinic at the Stevens Hotel, where full provision is made for the comfort of all those in attendance. The experience of conducting the 1929 Meeting at the Stevens has provided a basis for conducting the next meeting, which without doubt will reflect in a substantial measure the increasing importance of this annual event.

All members of the American Dental Association are cordially invited to attend. Preliminary programs will be mailed to all members of the A. D. A. some time in December of this year. The program will be divided into eight sections, as follows:

Section I—Operative Dentistry.
Chairman: Frank G. Conklin, 4010 West Madison St.
Vice-Chairman: A. E. Schneider, 25 East Washington St.

Section II—Full Dentures.
Chairman: E. C. Pendleton, 916 Galt Ave.
Vice-Chairman: S. A. Hutt, 3166 Lincoln Ave.

Section III—Partial Dentures; Crown and Bridge.
Chairman: W. I. McNeil, 59 East Madison St.
Vice-Chairman: R. A. Jentzsch, 185 North Wabash Ave.

Section IV—Oral Pathology, Histology, Bacteriology and Chemistry.
Chairman: J. R. Blayney, 2209 Rosemont Ave.
Vice-Chairman: W. G. Skillen, 311 East Chicago Ave.

Section V—Mouth Hygiene and Public Health.
Chairman: Lon W. Morrey, 4235 North Hermitage Ave.
Vice-Chairman: Corvin F. Stine, 1319½ Estes Ave.

Section VI—Orthodontia.
Chairman: Abram Hoffman, 311 East Chicago Ave.
Vice-Chairman: Harris W. McClain, 55 East Washington St.

Section VII—Oral Surgery and Radiography.
Chairman: Roscoe L. Stout, 55 East Washington St.
Vice-Chairman: Joseph G. Wiedder, 25 East Washington St.

Section VIII—Dental Economics.
Chairman: Harold S. Smith, 180 North Michigan Ave.
Vice-Chairman: F. van Minden, 185 North Wabash Ave.

The Program Committee is under the direction of Stanley D. Tylman, assisted by Henry C. Lee, E. C. Pendleton and Roscoe L. Stout.

The manufacturers' and dealers' exhibits will be held in the spacious Exhibit Hall, one flight down from the main floor. All applications for exhibit space should be directed to Dr. C. Davidson, Chairman Exhibit Committee, 55 East Washington St., Chicago, Ill.

HUGO G. FISHER, *President,*
HOWARD C. MILLER, *Secretary,*
55 East Washington St., Chicago, Ill.

THE PENNSYLVANIA STATE DENTAL SOCIETY will hold its Mid-Winter Meeting January 30-31, 1930, at the Penn-Harris Hotel, Harrisburg, Pa. A splendid program is being prepared.

RICHARD D. CROWLEY,
111 North Second St., Harrisburg, Pa.

THE NORTH CAROLINA DENTAL SOCIETY will hold its next annual meeting at Asheville, N. C., May 5-8, 1930.

DENNIS KEEL, D.D.S., *Sec'y-Treas.,*
Greensboro, N. C.

ARE YOUR ARRANGEMENTS all made for the Washington Meeting, October 7-11, 1929? The location is ideal, and is easy to reach from any point. No other city in the nation possesses such complete facilities for the study and advancement of the dental profession. You must go—it will be a delightful event.